Planning for Learning

An Analysis of the Components of a Child's Sustainable Learning Environment.

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Abstract

Planning for Learning

An analysis of the components of a child's sustainable learning environment.

This thesis arises out of the need to identify the effect of the state of the environment on the development of the child. The aim of this research is to progress a step nearer towards identifying the source of the present ill-fitting relationship between man and the environment.

The research focuses on primary school and kindergarten children, the environmental caretakers of the future. The research data emerged from an interactive process of participation, which gave the children a voice.

The study focuses on the natural environment and on the built environment as scenes where learning takes place. A methodology for understanding the child's environmental perception was developed and applied to three case studies in Germany, involving children between the ages of three and nine years.

A model of learning was developed explaining the relationship of the child to her environment and the mode by which knowledge is exchanged between these two. This was expanded to outline favourable and non-favourable conditions for learning. Subsequently, a set of variables for measuring the quality of the child's environment was developed. Recommendations were made concerning the content and methodology for planning external environments, and for a symbolic and subjective assessment of the environment, with and for children.

Preface

The actions of our super-industrialised 'first' world have misplaced the thread of discourse between man and nature. Technological developments have given rise to exponential growth in the use of resources. We no longer posses the ability to trace the effect of our actions, *Man's capacity to expand man-made systems and change ecological systems, can be expected to exceed by increasing amounts his ability to foresee the ecological and social consequences of his actions.*[1] The measure of the impact of the post-industrial age reveals itself in ever widening holes torn into the ozone layer, rapidly decreasing resource stocks, diminishing ecological diversity and other disruptions to the natural ecology of the planet. Since the United Nations Conference on Environment and Development in Rio de Janeiro, held in 1992, this knowledge has reached the ears of a broader audience.[2]

As Capra[3] argues, this present abuse is the culmination of centuries of Cartesian-dominated[4] thinking, where the earth was something to measure, classify and consume. Our present dream of civilisation differs from the contrasting Aristotelian view, which had given a purpose greater than our need for consumption to every particle of the universe.

Society can measure and quantify our ailing environment, but those people whose job it is to address its ill health, find scarce wisdom needed to reverse its demise. The Agenda 21, a document created with the intention of becoming a bible for ecological responsibility put forward forty-two theoretical propositions designed to address this imbalance of environmental abuse. The lack of sufficient practical implementation or political will to understand the implication of these propositions has so far prevented the realisation of a world sustainable society. The proponents of the movement for increased ecological

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[1] Bella, David The Quality of Life and Analytical Decomposition. From Engineering Issues : American Society of Civil Engineers Jan 1974

[2] See Al Gore, Earth in the Balance - forging a new common purpose.1992 Also, Zukunftsfähiges Deutschland : ein Beitrag zu einer global nachhaltigen Entwicklung. (Future Germany: a contribution to global sustainable development)BUND/Misereor 1996 See also original text of The United Nations Conference on Environment and Development (U.N.E.C.D.) - the Rio Declaration. 1992

[3] Capra, Fritjof. The Turning Point 1983 Pages 11-15

[4] See Encyclopaedia Britannica Pages 975-977 also reference to Platonic thought, of man's separation between the spirit and the material.

consciousness have been calling to a new paradigm,[5] which suggests there exist another system of relating to our world and each other. Their approach has been described as holistic.[6]The author has embraced this philosophy in search of a new paradigm for scientific investigation.

If we are unsatisfied by the effect of our present combined cultural actions, how can we progressively address this? If we, like the United Nations come to accept the absence of a sustained vision for the interaction of man in his environment, can we identify the transformation necessary to right the ecological balance of this planet?

Who is it who holds the key to this new way of operating within the world? The 1992 Earth Summit conference brought the United Nations to the conclusion that education is the key to providing an environment on this planet which is capable of supporting present and future generations without diminishing the ecological, social or economically measured quality of life. This concept of balance was termed, 'sustainable development'. Since Gro Harlan Brundtland coined the term during her period in office as secretary general of the United Nations in the Brundtland report[7], many efforts have been made to implement this vision of a world at peace with itself. The movement to which this terminology gave form, tenured a raised awareness of the consequences of our present actions. This awareness has seeped into the periphery of the collective consciousness through the publicity it received through the media, and is giving rise to the ethic of 'sustainability'.

Disseminating this ethic is the first step to defining an educational approach, which would address this new concept. The Agenda 21 of the Rio Conference charged educators with the task of distributing this new awareness; the fate of our environment rests in the hands of the educators - and the educated.

The issue of education

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[5] See Capra, The Turning Point 1983 Pages 285-466 for his description of the shape of this paradigm shift. The value systems of these varying paradigms are also explained clearly. Pages12-15 See also Schumacher, Small is Beautiful and The Ecological Self, Freya Mathews.

[6] Holistic, meaning that, *if anything has a certain property; then lots of other things must have that too.* Definition from Holism – A Shopper's Guide. By Jeny Fodore and Ernst Lepore Blackwell 1996 ISDN 0 631 18193 8

[7] The Brundtland Report. Prepared by the World Commission on Environment and Development.1985 –87 The term was actually first used publicly in 1980 by the International Union for Conservation of Nature IUCN in their publication 'World Conservation Strategy'. Reference from Zukunft für die Erde Nachhaltige Entwicklung als Überlebensprogramm. (A

This raises the question; to which audience is this education of a new awareness to be directed? The largest, 'captive' audience is that of our children. Presumed ignorant of worldly knowledge, the aim of the industrialised nations has, for centuries, been to form children's minds according to the dominant cultural paradigm. This has been labelled education. Intellectual equipment was deemed necessary to ensure the child's survival in the adult world where 'survival of the fittest' has been the war cry of the post-industrialised balance-sheet dominated world.

Our children are given the task of achieving that which we failed to do[8]. They are the bearers of our hope for change particularly when the culturally dominant adult sector choose not to devote their full energy to righting the balance they have inherited and caused. The environmental imbalance identified breeds a sense of insecurity within the current paradigm. More and more of us become aware that all is not rosy in the Garden of Eden which we inherited – newspapers and other media show a willingness to co-operate in this information. The doubts and insecurities, which this generates, have contributed to a sense of apathy. Being able to see a problem but without the means to identify a solution is surely the most hopeless situation. Gore[9] wrote articulately of this apathy. The extent of damage to the environment has become so great that we are no longer able to comprehend it. Burnt forests in Borneo and Chernobyl's exploded reactor, are examples far from our perception of the natural state of the environment. It is easier for the death of a beloved cat, or the felling of a cherished tree to stir us to action, for these are events for which we possess a relation. Maslow's[10] darker warnings that in times of insecurity, the population will restrict their efforts to fulfilling the bare essentials seem hard to dismiss. The onus for change has been directed to the 'next generation', the current one defining themselves as incapable of change by this very definition.

Future for the Earth: Sustainable Development as a Survival Program)(A Future for the Earth: Sustainable Development as a Survival Program) Buch 1 Sustainable Development ß Was ist das . Herrenalber Protokolle 9 Haber, von Lersner, Zahrnt, Diefenbacher, Renn, Rutjens, Halbritter, Altner and Feldhaus. 1997 ISBN 3 89674 110 1 Page 8

[8] The writing of Janus Korczak, the Polish born proprietor of homes for orphaned children and untiring proponent for the equal rights of children with those of adults. He strongly pursued a divergent opinion from the mainstream society, proposing that the child, born complete, had the right to realise itself, not to act as the instrument of unfulfilled dreams possessed by the parent or educator.

[9] Gore, Al. Earth in the Balance. Earthscan 1994

The transition to a new cultural paradigm, which the proponents of the ethic of sustainability would have us believe, is presaged by strong resistance. Capra denoted this as, 'the turning of the tide', documenting this phenomena in the rise and fall of similar paradigmal changes over history. Kuhn documents the development of scientific revolution whereby facts, which were previously accepted became placed in a new relation to the supporting elements around it. The ethic of sustainability contains nothing new, no wild discoveries; where its impact lies is in the manner of application of this knowledge.

As a structuralist model (where inter-relation of elements is more important than the individual elements themselves) sustainability has the potential to act as a leading force in the new paradigm. The new application of knowledge lies in the problematic of transferring a recognisable view of our environment as it stands. We need to know the extent of the imbalance. We need to identify the line of causality, which led to the crisis and to examine our relationship to these. This involves a learning process whereby we clarify our role as actors in the natural environment. Sustainability concerns itself with defining a new relationship of the place of human culture within the environment.

This thesis concerns itself with examining the role which children will play in the development of this new paradigm of ecological consciousness.[11] The author discusses how the relationship to the natural environment can be re-discovered, re-defined and made more conscious. It aims also to develop from this newly defined relationship a paradigm of man/nature interaction which we, in the adult world can use as a tool to approach the level of homeostasis that functioning ecosystems require.

Children can be seen as the future carriers of this new paradigm of environmental caring. What is it that we have to accomplish in order to make a difference? What is it which stops this learning among adults, and what is it which enables the child to inherently possess a

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[10] Reference to Maslow's prediction of concern restricted to basic needs in times of insecurity. See Maslow, Abraham. Towards a Psychology of Being. 1962 Van Nostrand Reinhold.

potential for the absorption of knowledge, but which paradoxically manifests itself as a tenacious resistance to change in later adult years?

Children are engaged in learning from the moment an egg is fertilised. Cells divide and, *nearly all inherited characteristics more complicated than a single gene change in the DNA involve gene and environment acting together*[12]. The environment exerts effect on the growing human being from its very conception, to the end of its life. Wherever an effect is being exerted, and a result is achieved, a learning process has taken place. Neurone formation in the brain is stimulated or depressed according to the impulses it receives from the greater environment.[13] These stimuli conspire together with the internal structure of the individual to create a lifetime of learning experiences[14].

It is undisputed that children learn. But is it possible that the quality and source of this learning are somehow related to the actions, and the values governing these, which children will take into the world of adults?

This thesis grew out of the desire to explore this world of learning and see, if there was a way whereby children could learn to regain much of what has for us become obscured: A relationship to their environment which could be described as healthy, viable for an ongoing process of evolution.

The issue of attaining sustainable development has been buffeted from one global political stage to the next. The term, more infamous than successful[15], has come to enjoy some notion of vague responsibility for our actions within the environment. It has yet to relate to a commonly regarded set of values, which could be considered an 'ethic' of sustainability. Here is a term without real substance;[16]agreed upon as a politically correct method of attesting to the fact that something had to be done. Faced with the dilemma of a valueless

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[11] "Ecological consciousness" a term used by Capra and Steindl-Rast, A Sense of Belonging (1991), and others – notably Mathews, The Ecological Self to describe this new awareness of man's place in nature.

[12] Steve Jones. The Language of Genes. 1993 Harper Collins. Page 226

[13] Chilton Pierce, David. Der Nächste Schritt der Menschheit. (Future Thought). Arbor . 1997

[14] See The Campaign for Learning: Learning for life. RSA Report 1998

[15] See Redclifft, Michael. Sustainable Development, exploring the contradictions. Methuen. 1987 Redclifft thoroughly investigates the dilemma of definition.

[16] The closest to 'substance' one can approach is within the document Agenda 21, the report created from the Earth Summit. The parameters are stated so wide that the vast gulf between practically identified aims, and the knowledge system which bears the culture to those aims has yet to be convincingly bridged.

or ill-defined container of values, upon which action for the environment is based, the first issue must be to state these values.

Environment. Children learning. Values. Sustainable development - where does this lead? If society agrees with the recommendations of the UN and accept that children are the key to change and any development, then there must be a knowledge of what is positive change, and of what kind of action can be taken to achieve this. Can society accompany this action with a structure of learning, which equips children for this task?

What we need, to prepare ourselves for the great transition we are about to enter, is a deep re-examination of the main premises and values of our culture, a rejection of those conceptual models that have outlived their usefulness, and a new recognition of some of the values discarded in previous periods of our cultural history.[17]Our ancestors learned their values through cultural inference. Their immersion in the culture and containing spiritual, social and physical environment, lead to an automatic inheritance of values. An individual need only breathe and live a normal life to become assimilated.

What we are witnessing today is an increase in the gap between the acknowledged prototype of the natural environment, which we took to our hearts over centuries of interaction, and the current reality. Our culture suggests that the British landscape is an endless picture postcard. Table mats, pictures in restaurants, the packaging in any supermarket, magazines and fabric designs would still have us believe the shire horses tramp the fields, eggs are collected at six in the morning from free-running hens, and all the motorways, factories and waste dumps were long ago buried under ground. The advertising industry has rightly identified such images as powerful motivators in a time when the reality is too dismal to afford much attraction. The irony is, using such images as tools of manipulation; the advertising industry is destroying the very value, which they are attempting to promote. 'Buy more', 'use more', have caused much of the problem of

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[17] Capra,F. The Turning Point. 1983 Page 15

resource scarcity, and irreparable damage, which now needs to be addressed. The question is, just how much longer can society continue to live in our exquisite fairytale bubble when the very resource on which it is based is about to crumble beneath us?

Society clings to aesthetic images located in a culture of the past; society is suffering from our own destruction of the bridge, which linked this aesthetic spiritual plane of experience to its place in matter.

The paradigm shifts, the poor health of our physical and social environment calls out for clarity in a world no longer united by a single cause. Care for the physical environment provides a common purpose amidst the search for values. As a common source, learning from this environment could provide the answers.

The research aims to understand the manner in which children relate to their natural environment, and to discuss the possibilities of intensifying this experience so that children may come to their own awareness of values. Since 1993, the author has been involved in the subject of sustainable development, the role of culture, and the place held within that culture by children. As a trained landscape architect and the mother of three children, the author was concerned with the capacity of the future physical environment to continue to sustain hers and other's children. The author spent time observing children's play, their health and general development. This was coupled with the observation of the provision for children's play and the changes in environmental conditions, which were constantly creating new challenges of adaptation for children and their families. The author was led to conclude that the provision for healthy play environments was inadequate.

Chapter 1 Introduction

The Development of the Thesis

There was a manner in the past by which societies formed their value structures. In a line of unbroken experience within the elements of the natural environment, connections were formed which facilitated the generation of value structures. As the cultures matured and developed, the material substance created by the culture blocked their line of connection to the natural environment. A gradual shift away from the source of experience took place; value judgements came to be based on handed down information in the way of tradition and myth. Today, the culture of the western world has little contact to the environmental resource upon which it was based. It has also lost the strong bond of contact to the line of tradition, which once held the values of the culture together. With neither one nor the other, our values float in a space, bearing no relation to any experienced reality. Coupled with this, are the changes to the environment which this loss of connection has caused- in the manner of inappropriate, unsustainable behaviour.

What society urgently requires today is a means to re-establish values which bear some relationship to the state of the world in which we live. We need to encourage an awareness of the connection between cause and effect of our action within the environment. Indigenous people and the ancient roots of our own cultural traditions achieved this through interactive processes within the physical environment in the form of rituals and ceremonies.

It seems reasonable to assume that our children of today are going to experience double handicaps in creating environments which are sustainable for two reasons: they have grown up in physical environments which are suffering from contamination, neglect, and environmental degradation through overuse and abuse. They have also been denied the experience of a pristine landscape, native forest, flourishing wildlife, and crystal clear

rivers. These children are growing into a world, which can no longer show them how a sustainable environment works.

This thesis attempts to explore methods where by the children of today can win back the tools they need to create the sustainable environments of the future. It aims to explore what form these 'tools' might take and how they might be facilitated within the physical environment.

The Introduction is designed to act as a guide to the structure and content of the thesis. Each section of the thesis is briefly explained. This is especially useful for the purpose of cross-referencing. The thesis is arranged into six chapters, the introduction and the conclusion. A list of figures is provided at the end of the text. Where possible, drawings and diagrams are included next to the relevant text. Where quotations or annotated extracts from other works have been used, these will be referred to in the footnotes. Otherwise, all quoted text is written in *italics*.

The research puts forward the following questions to be answered:

1. What defines the structure of our physical and socio-cultural environment?
2. Are we learning when we engage in this environment? If so, what are we learning?
3. To what extent is the direction of this learning affected by the structure of the environment, or by ourselves?
4. Is it possible to formulate a theory of this learning relationship?
5. Can we identify what it is which motivates children to choose certain physical environments compared to others?
6. Can we identify the root of this motivation in the state of the preferred physical environment?
7. Is it possible to develop a list of these motivations using analysis of representations of the child in addition to analysis of the physical aspects of the preferred place?
8. Can these motivation variables be used to gain greater understanding into the needs of these children?

9. Can these needs be used to reveal the nature of the relationship between the child and her physical environment?
10. Can we relate these variables of preference to physical and social phenomena, which can be implemented in a designed environment for children?
11. Can we ascertain a connection between certain types of environment and behaviour conducted there?
12. To what extent can a model sustainable environment satisfy these variables?

Can we use this knowledge to generate the physical form of an environment, which is appropriate for the growth, and development of children in a sustainable manner?

What is the Philosophical Context of the Thesis?

The thesis is based on a number of assumptions. The primary assumptions are:

- Physical, social and mental environments are suffering from stresses, which are unprecedented in our history. These stresses are manifesting themselves in environmental pollution, in cultural disorientation and in a search for sustainable values.
- It is possible to address these trends feasibly. This is important for those who plan and structure our physical environment.
- Sustainable development has been touted as a route towards re-establishing order in our self-created environmental chaos. This rationale can drive our investigation.
- The fourth assumption is that as developing future citizens of this earth, our children hold enormous power in their hands.

Chapters One and Two are devoted to setting the theoretical framework for the discussion on sustainability, the environment and learning. Chapter three discusses projects which have successfully addressed aspects of these three fields and which have played a part in generating the empirical research methodology. Chapter Four outlines the method used to

obtain the data from the case studies. The case studies were chosen as suitable vehicles from which to extract information about the environment, learning processes and the relation of this learning to sustainable development.

Chapter Five details the observations and data obtained from children of two German primary school classes. Chapter Six presents the third case study: an analysis of the grounds of a German kindergarten, planned by participation.

Chapter Seven develops a theory of experiential learning, discussing how the children form values through action in the environment. Chapter Eight presents a set of variables obtained from the analysis; used to understand the relationship between the child and her environment. The Conclusion contains a brief review of the main areas addressed and those findings, which arose from the research. Reference is made to the objectives: how they have been answered, and what implications these answers exert on a more global scale. A series of recommendations is made to the fields of planning and education.

Chapter 2

Environment and Sustainability

Defining Environment

The word, 'environment' is understood in many ways. This chapter aims to clarify the intended meaning in the context of this work. The definition assumed here is based on the widest interpretation available, that of the systems in which society exist. These are physical, cultural and mental or spiritual. For the sake of greater clarity, at times specific aspects of the environment are referred to and these are given explicit names, such as the physical environment. It is well to mention here that the term, 'natural environment' is generally avoided due to the ambiguity, which surrounds it. 'Natural' is a word which has suffered much abuse. It has been made synonymous with all that is, 'green', and separate from the super-industrial age in which society in the Northern Hemisphere predominantly lives. If the author is to give any credit at all to the ecological movement of the past thirty years, then this belief must be seen as nonsense. Society's very problems stem from the fact that nothing can be separated from the waste, dirt and chaos created by our civilization, and we must regrettably agree that there is no place on earth which has not been touched by its influence.

Humanity is immersed in the environment, the outer extremities of which extend far further than the eye and telescope can see, the inner borders finding their origin deep within the structures of the consciousness and the mind and spirit which compels society to act.

Humans live surrounded by water and earth, air and energy of all wavelengths, the elements of which are recombined within the complex biology of our cellular mechanics to form us, man.

In any attempt therefore to define environment society has to consider all that is without and all that is within us, if nothing is to be omitted. The environment must therefore also be home to the musings and conjecture, calculations and dreams eliciting from these human cells, the consciousness, and the cognitive and spiritual realm.[1] The fact that they are produced by biological organisms living on this planet, renders them essential in the consideration of our environment.

Environment is not always understood in this width of definition. Most ecologists would consider, 'environment' to be the sum of physical conditions. The organisms to which these give rise are those which populate this environment. This 'natural environment' usually views man as an outsider, who wields considerable influence. Environmental psychologists and planners tend to concentrate on the human interaction with their built environment.[2] *The emphasis of the environmental movement and of most environmental education programs has been upon the natural environment. Related to this, environmental education in most countries has been seen as the task of educating the public about the nature conservation or how to protect the natural environment from damaging human actions. There are, however other groups of professionals, who educate children about, and lead them to be involved in, environmental settings with little or no attention to the natural environment.*[3] Hart is here illustrating the divide between the two 'camps' of environmental action groups; one addressing the socio-cultural aspect of environment, the other, addressing the biological, ecological side. The terms 'natural environment', 'physical environment', 'built environment', 'external environment' are variations aimed to give particular emphasis to different issues. What Hart is keen to

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1 See also, Capra, Fritjof. The Turning Point. Flamingo. 1983. Page 320 "The psychological realm..... include self-awareness, conscious experience, conceptual thought, symbolic language, dreams, art, the creation of culture, a sense of values, interest in the remote past, and concern for the distant future."

2 The work carried out by Sutton in the Urban Network Programme is a good example of the concentration on the built physical and social issues of environment. Satterthwaite has also described projects of environmental improvement in underdeveloped countries primarily carried out to improve the state of health of the communities. Many of these projects do bear ecological considerations in mind during the planning, but most are restricted to producing immediate short-term improvement. See Environment for Children 1996 Earthscan.

3 Hart, Roger A. Children's Participation UNICEF/Earthscan 1997 Page 4

emphasise is the necessity *for environmentalists and human development professionals of all kinds to begin to work together so that the total environment becomes the concern of environmental education.*[4]

What then is to be gained from viewing the environment in this holistic manner?

Relationship of Man and Environment

Many of the studies now circulating on the theme of facilitating development which is sustainable, (where growth is directed by the pace given by the natural environment), have criticised the current Western paradigm of man in relation to his environment. The German study, Zukunftsfähiges Deutschland[5] suggests a new form of relationship to be formed between man and his environment; *it is not only humans who stand alone, to be served by his environment. This thought prevents us from continuing to ignore other living organisms. This stance goes further than merely enlightened anthropocentricity, and views nature as the object of an ethic.* Gore describes this new role as a, *co-architect of nature*[6]. He argues that it is the relationship of man to the environment, which must change as it this which causes the most damage, and possesses the greatest potential for bringing about positive change. His book, Earth in the Balance undertakes to describe the factors, which led to *the relatively recent dramatic change in the relationship.* The, 'out-dated' relationship of man and environment is summarised neatly; *we have assumed that our lives need to have no real connection to the natural world, that our minds are separate from our bodies, and that as disembodied intellects we can manipulate the world in any way we choose. Precisely because we feel no connection to the physical world, we*

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4 Hart, 1997 Page 5

5 Zukunftsfähiges Deutschland, Ein Beitrag zu einer global nachhaltigen Entwicklung. (Future-potential Germany: A contribution to a global sustainable development) BUND and Misereor. Principle authors, Reinhard Loske and Raimund Bleischwitz. Studie des Wuppertal Instituts für Klima, Umwelt, Energie. Birkhäuser Verlag. 1996 ISBN 3 7643 5278 7. Page 35

6 Gore, Al Earth in the Balance. Forging a new common purpose. Earthscan London 1992 Page 34

trivialise the consequences of our actions.[7] E. Relph has explored our perception of what constitutes 'environment' in his book, Place and Placelessness[8]. He suggests that, *such a perspective tends to consider the environment not as a centre of human existence but at best, background to activities that are without sense, and at worst as a void.* How do we begin to consider the experience of environment as the, 'centre of human existence'?

The Role of the Environment in Child Development

Montessori, Liedloff, Piaget, Reich, Elkind, and Wild[9] have all separately expressed the observation that the quality of early environmental experiences strongly influences the kind of actions to be taken in adult life. Joseph Pearce writes of the child from the neuro-biological stance. Freud saw this relationship as a simple, linear link between childhood experience and later manifestation in the state of the adult psyche. Capra writes clearly of the link between childhood experience and later life patterns: *Every psychological event has a definite cause and gives rise to a definite effect, and the whole psychological state of an individual is uniquely determined by 'initial conditions' in early childhood.*[10]

Freud concentrated his attention on the social, 'initial conditions'. The author expands this to include the genetic make-up of an individual, and the physical setting, which surrounds them. Ujam's thesis, describes the interaction of various forming influences on the development of the individual: Many biologists, *emphasise those aspects of man's nature which can be described as physiochemical systems and which unfold according to the information inscribed in the genetic code. Others attempt to trace the origins of human species in the hope that knowledge of its evolutionary past will help in understanding its*

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7 Gore, Al 1992 Page 144

8 Relph, E. Place and Placelessness. Pion Press. London. 1976

9 See Bibliography. Chapter two describes more of these observations in detail.

10Quotation from the Turning Point. Capra, F. Flamingo Press 1983 ISBN 0 00 654017 1

present condition.[11] *Still others are more interested in the physiological psychological characteristics of each individual person, as conditioned by the environment. Different as they appear to be, all these aspects of the study of man are interrelated. ... In reality, man is an integrated entity and all these forces operate simultaneously in every moment of his life. The body and mind are the living records of countless influences, which have shaped each individual person from the most distant past to the present instant.*[12]

Jones quotes an example from Briggs[13] where he uses the example of the growth of a tree to explain the link between environment, inherited genetic material and social influences on its development and growth. We can expand upon this example to use it as a metaphor to compare the growth and development of a child, and the possible impacts, which can inflict or support its development:

The tree grows from its genetic material, the seed, but the size, strength, fertility, beauty, stability and *usefulness* of this tree depends on many factors. If the wind is too strong from one direction, wind-chill will exert its pruning affect on the branches, and the resulting tree will be asymmetrically formed in a constant state of adjustment as it grows to maintain dynamic equilibrium. If the soil is too shallow, the roots will spread out. Their spread, is in turn dictated by the presence of for example, rocks as obstacles to free growth within the soil, or of the proximity of other trees whose roots are also struggling to find hold in the thin film of soil. Deep soil and abundant quantities of clean groundwater will also influence the trees' natural function of drawing water, enabling the canopy of the tree to grow large and strong. This bears influence on the trees' chances of surviving the next heavy storm. The social climate about the tree will dictate the function, which this tree is fulfilling, as will the location in which it was planted. A tree growing in a town is placed there for aesthetic considerations, for improving the quality of the air in polluted streets; perhaps its fruit is

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11 Ujam, Dr. Faozi. PhD Thesis: Ecology, Culture and Cognition . A Textbook on the principles of Environmental Design. 1987 Page 168. See also Leakey, Richard Origins Reconsidered for his appraisal of the role of the past in the forming of consciousness. Abacus. 1992

12 Ujam, Dr. Faozi. 1987 Page 168

13 Jones, S. 1994 Pages 225 - 244

harvested, or perhaps the branches are continually trimmed to enable heavy goods vehicles to pass with ease beneath. If the tree seed fell to the ground within a park or nature reserve, the chances for an undisturbed natural lifecycle are higher than within inner city wasteland. In the interests of preserving old trees for their historical, ecological and aesthetic values, the life span of such a tree may be artificially prolonged. Cosmetic and structural surgery may be undertaken to rid the tree of troubling rot, or stability problems naturally associated with age when old trees gradually lose their branches. In every case there is a constant interaction between a diversity of influences, which seamlessly shape and form the tree's development.

To equate the development of a child to that of a tree would be too simplistic an approach. Although the same laws governing the development of a tree can be applied to any other living entity, whose growth is dependent not only on the genetic material with which he is provided at conception,[14] but the richness of the entire experience of his life. Just as the quality of food eaten during the crucial growth years of childhood can influence the development of the physical frame, so can the quality of familiar love, the pollution of the air, the colours of his surroundings, the presence of nature, or the domination of the motor vehicle all affect the growth of the self. Maturana and Varela put this most convincingly in their joint book, The Tree of Knowledge[15]. They compare every individual to the organism of a single cell. A cell has a nucleus, a series of internal membranes, and, most importantly, an external membrane. Mostly, the cell exerts it selective ability to stop or allow the passage of information through the membrane. The cell extracts that which is needed for nourishment and growth from the chaotic environment without. The nucleus serves the function of ordering the selection from this external environment of chaos. Maturana's equation with the child suggests that the child already possesses all the

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14See, The Language of Genes..Jones, S. Flamingo Press 1994 ISBN 0 00 654676 5

15 Maturana, Humberto, R. and Varela, Fransisco J. The Tree of Knowledge: The Biological Roots of Understanding. Cambridge, MA New Science Library. 1987

information she will need, stored in accessible form in her, 'nucleus'. This internal programming or consciousness pre-selects those influences, which it requires from the external chaotic environment, and allows their incorporation into the consciousness, (the cell). If, as Pearce wrote, the environment is 'suitable' to the needs of the developing child, then the necessary ingredients for development will be available. If the environment is unsuitable it could be that the membrane is damaged, that the child is so overpowered by the strength of the external environment that she no longer has full control over that which enters or exists. Mauricio Wild who has jointly run the Pesta School in Equador for the last twenty years follows this line of thought in his daily observations of the children in his school:

In the interaction guided from inside the self, makes itself in relation to outer circumstances. If the outer supports this process, then the organism will feel harmony with the environment, and a loving relationship with it will have been established.

On the contrary, if the outer circumstances do not support this process, then the experience will be "the environment is dangerous or even an enemy", and to fight against it is no problem[16] Wild puts forth the argument that violent behaviour is the result of a coupling between a non-supportive environment and a defensive individual. Rebeca Wild summarises this relationship as:

Every living organism makes himself. Whatever he does in interaction with the environment is not for outer results, but for the only purpose of building his own instruments of life in this world.

Only if he interacts from inside out, not 'stimulated' or 'guided' from outside, this development is in accordance to his inner and therefore 'responsible' to himself.

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16 Extract from correspondence with Mauricio Wild, July 1999. See also reference to Rebeca Wild's books; Education for Being, Sein Zum Erziehung, Kinder in Pesta, Feiheit und Grenzen, Liebe und Respekt.

Jean Liedloff observed the Yequana people of the South American rainforest and developed her *Continuum Concept*. The continuum concept involves the capacity to retain childhood experiences made in the early phases of development. Liedloff proposed that this early experience of symbiotic exchange with the surrounding natural environment provide the members of the Yequana culture with a firm sense of their continuum in this environment. Liedloff proposed applying some of the concepts utilised by the Yequana in their practice of child rearing in order to develop this continuum. This theory was taken on board by many parents seeking to raise their children in a manner, which acknowledges the two-way relationship between man and the environment. Liedloff's aim was to recapture the natural relationship of respect among humans and within the environment, which she no longer felt to exist in modern western society. Fritjof Capra[17] suggested that the nature of change occurring on an evolutionary basis in the ecological systems of the planet would, when applied to cultural evolution supply us with a cultural system as sustainable as the ecology of an undisturbed natural environment.

Both of these viewpoints emphasise the need to learn from the natural systems surrounding our human culture in the environment.

Value formation and Learning Responsibility

The author refers now to the issue of value formation. Briefly, the author has shown how interaction between environment and the individual affects personal development. Society can move further to explore the development of value systems. The following explanations are based on Julian Steward's theory of the *cultural core.*[18] Julian Steward proposed the model of the *cultural core* in which he stated that culture is defined by a series of core values. These core values arise out of an interaction between the specific physical

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17 Capra, Fritjof. The Turning Point. 1983. Flamingo Press. Pages 293-5

18 Taken from, Man Space and Environment. Concepts in Human Geography. Edited by Paul Ward English and Robert Mayfield. Oxford University Press. 1972 Pages 115-118

environment, and the continuum of the historical context in which these reactions are taking place, which to whatever degree of development, can be labelled culture. His emphasis lay on stressing the development of each value from aspects and processes inherent in the natural environment. This kind of research has been labelled *cultural ecology* which *studies the interactions of societies with one another and with the natural environment in order to comprehend those processes of adaptation and transformation that operate to alter social institutions, human behaviour and environment. Ideally, the entire ranges of social and natural phenomena are comprehended in a single, "ecosystem", thus disposing of the artificial separation between man and nature. ....Steward defines cultural ecology as the study of those processes by which a society adapts to its environment.*[19] Steward stresses that there is no one system of reaction to an environment, but that each environment and the resultant culture must be studied with care in order to describe the nature of the man-environmental relationship. This is not environmental determinism, but a holistic approach to a problem of interrelation, feedback and action-reaction. His research *stresses analyses of the relationships between environment and the exploitative technology, those patterns of human behaviour involved in environmental exploitation, and the relationships between these behavioural patterns and other aspects of culture.*[20]

Steward refers to the development of a value through the process of interaction between man and the environment. The abstraction of that interaction into a cognitive structure goes on to generate a value when the experience is repeated with frequency (in other words, the experience comes to be held important). This is the same thought which Maturana and Varela share in the discussion of structural coupling. They define cultural behaviour as, *the transgenerational stability of behavioural patterns ontogenetically*

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19 Man, Space and Environment. Concepts in Human Geography. Edited by Paul Ward English and Robert Mayfield. Oxford University Press. 1972 Pages 115 - 118

20 See above

acquired in the communicative dynamics of a social environment.[21] Behaviour is also defined as, *a description an observer makes of the changes of state in a system with respect to an environment with which that system interacts.*

To explain this process of value formation we can analyse a fictive but not unlikely example of value adaptation.

Jean Liedloff in *The Continuum Concept* suggests that so long as the introduction of new technology to a traditional culture modifies only the surface of the culture, then the values will remain unaffected. This occurs if the new technology is related to and developed from the traditional model and therefore the value structure, which aided its creation. In order for an introduced item or procedure to have this insignificant effect, it must be able to be interpreted from within the traditional knowledge structure.

The replacement of a timber pole with a metal-ended hoe to till the soil for example, can be insignificant if the culture already uses the technology of metal smithing in some form. The results of using the new hoe will be seen in improved soil cultivation and probably increased crop yield. When however, the craft of metal smithing is foreign, there will be a gap in understanding between the technology and the traditional knowledge. Results will be felt, but if the knowledge of the material metal is not familiar to the traditional culture, the dangerous outcome could be that any western technology would come to be held in awe without necessarily having to undergo rigorous tests. This consequently devalues the traditional technology thus gradually eroding at the cultural foundations. Such observations have generated the concern for applying 'appropriate technology' only in development programs. 'Appropriate technology' concentrates on providing modifications to existing traditional technology.

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21 Maturana and Varela. 1992 Page 201

Examining something as powerful as a gun, and its introduction to such a traditional culture the author suggests how more profound are the consequences.

The traditional method of hunting for the Yequana is to locate, chase and stalk the animals until they can be killed swiftly and with little shock. With the introduction of a gun, the process of communion between man and beast is cut out and replaced with a 'point and shoot' method. Hunting is one of the skills required to be learned by a male; usually accomplishment of such skills indicates a state of maturity and manhood which is then the 'passport' to other male rituals, such as marriage or the marked passage of boy into manhood.

Most people can fire a gun; the chance of hitting and wounding an animal is much greater than by stalking an animal or capturing one with a rope or a knife to kill it. The communication between hunter and hunted is suddenly reduced to a linear play of power. Man is dominant over beast due to the weapon he holds in his hands. The dual play of skill in the dance to capture the animal is made redundant. Who needs skill when one has the power of technology.

A change of perception occurs as gradually, more and more animals are brought in with bullet wounds in their hide. The gun affords a sense of superiority due to the increase in the catch, one, which has no base in the cultural values. We remember, the Yequana communicate with their environment in a way, which ensures the continuity of all resources, which they require. With the power of the gun controlling, a gradual divorce between man and animals takes place.

The gun acts as the carrier of the values, which created it, these are contained in the mechanistic paradigm of Rene Descartes. This heritage paved the way for twentieth century super-industrialisation and technological development. This paradigm has gradually eroded into the predominantly sustainable base of traditional cultures as a result of such thoughtless introductions.

The metal hoe story, shows effect to the most external layer of culture, cultural expression which includes the technique of carrying out a task. The gun however, penetrates to the very heart of the culture, where the values are stored.

The application of appropriate technology has been born out of the recognition that participative approaches to problem solving are more successful than any imperialistic approach. Participative action recognises the root of technological developments: the need to find a solution to a particular set of circumstances existing in the environment.

This has implication for planners on considering the appropriate form, content and function of environments designed for use by the child. Whatever 'improvements' are made must be able to be integrated into the understanding, (cognitive structure) of what the children already know. Otherwise, the environment will be rejected or used but without understanding of the motivations behind the planner's mind. This reinforces a sense of powerlessness in the child. He is reduced to the status of a consumer, when he could have been a powerful participating creator.

So far the author has examined this traditional culture in terms of internal effects. Broadening the context, the author takes these examples as cases of 'invading' or 'colonial' values to use it to develop theories for a system of value learning.

If society aims to be sustainable it must have self-governing individuals, each secure in a value system which they have developed in response to all aspects of their environment; socio-cultural and the physical. This stand is being taken-up by those planners who aim to impart 'empowerment' to the users of designed environments.[22]

The example above however reveals how susceptible value systems can be to external influences. It is therefore important that there exist some form of in-built protection mechanism which prevents the invasion of foreign values which have no place in the

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22 See Roger Hart. Children's participation. Chapter 2. UNICEF/EARTHSCAN 1997 ISBN 1 85383 322 3

particular environmental constellation, a self governing 'screening' process rather like that employed by the immune system within our bodies.

The strength of traditional societies is their collective strength; each individual contributes to the wellbeing of the whole, each satisfying some important aspect, which enables the perpetuation of the culture; its sustainability. The individuals share a core of values, carefully adapted as a response to the satisfaction of life within their environment. How these individuals may express these shared values is to a large part determined by their genetic heritage and their particular developed character traits.

When an external influence threatens traditional society, it first penetrates these outward layers of physical expression. The effect of this influence if strong enough (as in the case of the gun) will continue its affect until it has worked through enough individuals to begin to affect Steward's core of values. The core values, being protected by every member of the population will only be affected if enough individuals have been affected by the influence. In the case of the gun, the results it brings are so blatant and powerful that it is hard to ignore.

What then is an isolated individual from our western culture to do when confronted by the same dilemma? Somehow there has to be a method whereby the individual protective barrier surrounding the core of values can be strengthened. This question is returned to in the last chapter with reference to the findings generated by the research; the question of how each child through her interactions with the environment can form her own value system.

Reading the Environment as Text

The author has described briefly some theories on the development of cultural values and forming a continuum between culture and the environment.

Assuming the view that the individual is created out of the sum of interactions between herself and her environment; what is left to find are some keys to understanding the manner in which these interactions take place. What is it about the environment, which facilitates certain reactions, which lead to the formation of values, over others? To satisfy this, the author turns to the field of semiotics, which, provides a means of probing these interactions further.

The science of semiotics is concerned with studying the representation of meanings of things. Environment can be studied as a semiotic, *text.*

The semiotic agenda is thus shaped by a search for the 'representational system' behind human forms of expression. Meaning is contained in these forms (known technically as signs*). The coherence of these forms into an over-arching system of meaning produces what we call culture.*[23] Virginia Valentine of Semiotic Solutions clarified the meaning of semiotics in its usage as a tool to assess environments in the Learning Through Landscapes study, Special Places, Special People: *Semiotics isn't so much an academic discipline like, for instance psychology, as a theoretical approach to the study of communication and interpretation...school grounds give out coded messages to the children who use them (sic.) about their identity as part of a group of 'users'*[24]

The author begins with the assumption that the environments chosen by the children can be 'read' and studied for the purpose of our analysis; consciously or not, these same transmitters are under the scrutiny and interpretation of the children using them. For the purpose of this study, it is necessary to name and categorise these transmitters.[25] Titman

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23 Quotation from M. Danesi and P. Perron. Analysing Cultures. An Introduction and Handbook. Indiana University Press.1999. Page 15

24 Virginia Valentine. Semiotic Solutions. Special Places Special People. Titman. WWF/Learning Through Landscapes. 1994 Page 16

25Reeder, Dr. R. Private conversation on Semiotics 1995 - She has lectured on Semiotics at Harvard University.

used semiotics as a tool with which to analyse the response of children to their physical environment. Her research identified key factors within the physical environment, which served as indicators of the children's preferences for certain kinds of environment. The conclusions of their study can be summarised: *Children read the signifiers of external environments as elements as a reflection of their own needs for 'being' and 'doing' and 'thinking' and 'feeling' within a cultural context.* These were: *Tarmac, Grass, Trees, Flowers, Mud and Sand, Ponds, Bushes and Dens, Fixed Play Equipment, Furniture and Other Structural Features, Animals, Litter and Vandalism.*

Children valued the external environment on a variety of levels.

Natural environments were preferred to built environments.

Natural external environments were 'read' as places, which promised to meet a range of needs, which children felt to be important for them.

External environments were judged according to the way they looked and made children feel.

Children were very critical of the attitudes and actions of adults in relation to the external environment in general.

Access to preferred external environments varied considerably according to where the children lived.

These findings documenting the environmental influence on behaviour serve Maturana and Varela's model of cognitive development. What Titman found, was a valuable source of factors to which children responded in their school grounds: *it seems that the majority of children enjoy access to the outdoors; that they value natural environments and places which offer variety and diversity, and which offer 'potentiality' for change and are manipulable; that they actively seek out places and elements which present opportunity for risk and challenge and that, whilst such places need to facilitate social interaction,*

children highly value environments which provide a degree of privacy.[26] These findings contributed towards the analysis of the research in chapters five and six of the thesis.

The Development of Environmental Awareness

At first, environmental awareness was a natural means of survival; Richard Leakey an anthropologist, argues that the development of *Homo sapiens* was afforded by a positive feedback loop of environmental interaction:[27]

This concept advanced with man's development. Liedloff [28] suggests that man made a success of his environmental interaction, up until the process of 'civilisation':

During the brief few thousand years since he has strayed from the way of life to which evolution adapted him, he has not only wreaked havoc upon the natural order of the planet, but he has also managed to bring into disrepute the highly evolved good sense that guided his behaviour throughout all those aeons.[29] This 'good sense' is important in our consideration of the development of an ethic of sustainable environmental awareness. Although the word 'sustainability' sounds new to our twentieth century ears, there have been many practitioners of its principles up until very recently - those last retainers are however, struggling to defend their way of life against the dominant culture of exploitation.

Sustainable Development – a history

Sustainability, or sustainable development has come to represent all movements which champion environmental stewardship. The word has, *emerged in recent years among advocates for a more conserving, integrated approach to economic, social, and environmental concerns in local, national and global communities.*[30]. There are many

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26 Titman 1994 Page 67

27Leakey, Richard and Lewin, R.. Origins Reconsidered 1992 ISBN 0 34910345 3 Page 166-7Those primate forerunners to Homo sapiens, with larger brains required more protein-rich food, which in turn, required more intelligence to obtain. There became a necessity to wield tools, which in turn stimulated the brain development.

28Liedloff, Jean. The Continuum Concept 1989 (1975) ISBN 0 14 019245 x

29Liedloff. Page 34

30 Sutton, Weaving a Tapestry of Resistance 1996 Bergin and Garvey.Page 6

interpretations of its meaning, and the following section will attempt to explain some of these variations and the history of their development.

The Brundtland report or, *Our Common Future*[31] brought the term *Sustainable Development* into being. The World Commission on Environment and Development (WCED) commissioned the 1987 report led by the then Swedish Prime minister, Gro Harlem Brundtland. They first coined the term "Sustainable Development" as an objective to address the issue of environmental degradation and the need for action to contain and repair this. This was refined and publicised as the leading principle of Agenda 21, the document signed by 170 nations during the 1992 Earth Summit held in Rio de Janeiro.

The word sustainable was defined as the ability of human activity to meet, *the needs of the present generation without compromising the ability of future generations to meet their own needs.*[32]. This has become, *one of the most widely used and quoted summaries of the goals of sustainable development.*[33]

Defining 'Sustainable'

By nature, the word, 'sustainable' is static; the Oxford Dictionary's definition of something, which can, *uphold, for a longer period of time,* implies that the same position must be maintained over time. Sustainable, without the development is inflexible and the word has difficult implications for applications to situations where change and evolution are inevitable.

In the 1970's Toffler[34] predicted *the organizational geography of super-industrial society can be expected to become increasingly kinetic, filled with turbulence and change. The more rapidly the environment changes, the shorter the life span of organization forms.*

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31 WCED 1987, Our Common Future, Oxford University Press. Page 8

32 Sutton, Sharon. Weaving a Tapestry of Resistance. The Places, power and Poetry of a Sustainable Society. 1996 Bergin and Garvey. Page 6

33 The Environment for Children, David Satterthwaite and others. Earthscan Publications, 1996. Page 151

34 Toffler, Alvin in his book, Future shock 1970 Page 130. The book was written to indicate trends, just like John Naisbitt's predictions books, Megatrends 1980's and Global Paradox 1994 who state similar concepts.

The choice of the word, 'sustainable' seems largely dictated by the perceived need to counteract these ever increasing changes. Commonly defined as progress, we have witnessed accelerated change in the super-industrialisation of the Northern Hemisphere within this century. It is this progress of industrialisation, which has cut great swathes through the natural environment[35]

Al Gore's book, Earth in the Balance provided a comprehensive encyclopaedia of the extent of these changes caused to the natural environment by the process of human development. The scars and abuse to this environment, which Gore describes were beginning to become common knowledge to ecologists and other environmental scientists in the 1970's[36]. This knowledge, coupled with the move towards systems thought[37] (where the parts of a system interact to affect the entire whole in ways not always predicted by traditional linear science), resulted in the search for a concept, which could begin to address the repair of the damaged systems of the earth environment. *Systems theory, looks at the world in terms of the interrelatedness and interdependence of all phenomena, and in this framework an integrated whole whose properties cannot be reduced to those of its parts is called a system. Living organisms, societies, and ecosystems are all systems.*[38]

The word, 'sustainable' has been used to imply balance, neither the needs of human beings nor the needs of the natural environment should take precedence in this philosophy. Anaerobic and aerobic, anabolic and catabolic processes, Chinese Yin and Yang[39], are the two-sides of this balance which sustainability is attempting to achieve.

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35 Rachel Carson's famous book, The Silent Spring. Intended for the greater public, this was the first piece of literature in the United States of America to openly state this connection.

36 1972 saw the first Stockholm UN Conference to address environmental protection.

37 For references, see Capra, Fritjof the Turning Point 1982 pages 26 and Chapter 9, and von Bertalanffy, Ludwig. General Systems Theory 1968 Braziller Publishers

38 Capra, Page 26. See above.

39 Chinese philosophy of the balance of creative and destructive side of life.

Defining Development

This term stands for progress, for movement for change and for growth. Each of these can be understood in a manner, which contains either balance or instability. As Dr. Warren Flint wrote[40], *Development that is sustainable means achieving human well being without exceeding the Earth's twin capacities for natural resource regeneration and waste absorption. In most instances, this implies thinking about things other than simply "growth."* Elisabeth Graffy[41] defines, 'development' in the wide sense of goal achievement particularly with respect to the human cognition: *"Development," after all, is a concept that captures multiple, adaptive goals that we seek to evolve toward both as individuals and as a living community. Not all of these goals are material and, in fact, there is an argument to be made that material goals are generally in the service of more abstract goals related to quality of life, protection of future generations, satisfaction of basic needs (material and otherwise), etc. We talk about the material things because they are easy to grasp and hard to ignore, but hunger and poverty and the need for a new Volvo station wagon with windshield wipers on the headlights really stand as proxies for other, deeper goals we seek.*

Graffy refers to human development; Michael Redclifft[42] argues that, this philosophy does not apply when economic gain results from development. Resource extraction, processing or raw materials, consumption of energy and land, and decreasing natural ecological diversity are usually the results of development defined in the traditional manner. This 'traditional' development is as old as the origins of the cultures of the northern super-industrialised nations.[43] Linear reductionist philosophy lent itself to the mode of scientific

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40 Dr. warren Flint Quoted from the World Bank Knowledge discussion forum 1999.

41 Graffy, Elisabeth. United States Government advisor on environmental policy. Quoted from the World Bank Knowledge discussion forum 1999.

42 Redclift, Michael. Sustainable Development, Exploring the Contradictions. 1987 Methuen & Co. Ltd. UK

43 See Heraclitus and Parmonides ancient Greek philosophers whose work embodies the debate between linear and systems thought. Parmonides believed the world to be based upon organisations of association between elements best understood in terms of their isolated parts. Heraclitus postured the systems approach of interrelation and interdependence. This summary is based on work carried out by Michael Alexander while at the Edinburgh Sustainable Architecture Unit.

discovery proposed by Rene Descartes[44] which since the seventeenth century has dominated the pursuit of knowledge in these countries. This reductionist view can conceive of development as, *always leading to material growth, increase of resource depletion and pollution in a finite world.*[45] An example of this kind of development would be that of a typical industrial estate development on a green- field site.[46]

Defining Sustainable Development

Sustainable development requires a marked departure from the present global collision course between environment and development. It is an open, sociological search based on value judgements and an acknowledgement of ecological limits. This statement was formed by the German authors of the report, Zukünftiges Deutschland, a study designed to identify the future path of development which, when adopted by Germany would lead to a state of sustainability between development and the environment. Parts of this *search* have been identified below:

Many organisations have favoured splitting sustainable development into three sections: ecological, economical and sociological. The UNCSD (United Nations Commission on Sustainable Development) formed after the 1992 Rio conference was designed to oversee the implementation of Agenda 21. They lead the way in sectionalising sustainable development: Section one deals with the social and economic aspects such as combating poverty, changing consumer patterns, population dynamics, health, planning policy, and developing tools of decision-making which allow the common populace to contribute to the implementation and local interpretation of Agenda 21 policy. Section two concentrates on the question of preserving and protecting natural resources. These are: the protection of the atmosphere, integrated approach to the use of ground resources (minerals, soil,

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44 See the Biography, Descartes by John Cottingham 1986 Blackwell Publishers for a brief introduction to his thought.

45 Extract from Lelmut Lubber's contribution to the World Bank Internet discussion on knowledge 1999

46 A current topic of discussion in October 99; The Dutch Friends of the Earth campaigned for no more new industrial developments or business parks should be built on "green field" sites between cities. Dutch Society for Nature and Environment (http://www.snm.nlFriends of the Earth Netherlands)

building material etc.), management of sensitive ecosystems (which is divided into the desert and mountain areas), encouraging sustainable agriculture and rural development, maintaining natural diversity, environmentally sensitive use of biochemical developments, protection of the oceans and freshwater systems, sensitive use of toxic chemicals, and sensitive disposal of dangerous waste including septic and radioactive waste.

The third section relates to the empowerment of special groups to be involved in the decision-making and implementation of decisions, which will affect them on a local and global level. Women, children, native populations, Non Governmental Organisations, local government, employees and unions, private sector, science and technology and, farmers are the groups named in Agenda 21. In December 1993, eighteen months after the Rio 'Earth Summit', Finance and Development, the informative journal of the World Bank published five articles stating their view on the debate. Ismail Serageldin[47] *stresses the need to broaden our concept of development by integrating the approaches of sociologists, ecologists and economists.* Each of the three disciplines hints at some commonly understood definition, which is yet to reveal itself. There is a need to extend the disciplinary borders to reach an understanding of sustainability, which can work within all three of these spheres and the myriad other disciplines which it inevitably, affects.

When environmental activists, ecologists, economists or sociologists who separately analyse the agenda seize upon sustainable development, the resulting policy has been elegantly interpreted according to the individual's hidden agenda:

'Sustainability' immediately became a catchword for people (who) wished to show that their actions were environmentally orientated. This naive but honest misuse of the word to describe a simple action or a goal, when it was meant to describe complex relationships, was then high-jacked by people who wished to assume the moral right to continue

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47 Serageldin, Ismail, Head of the Vice Presidency for Sustainable Development. In Finance And Development, December 1993 A Quarterly Publication of the International Monetary Fund and the World Bank

environmentally destructive activities as the new environmental consciousness was emerging in society. From this adapted use of the word a logic developed that subsequently allowed arguments to be put forward for anachronisms such as, sustainable landfills.[48] This attitude can be seen clearly in the advertising industry. The battles fought for the 'greenest' image are usually based on superficial changes to a product, such as the omission of unnecessary perfumes from a washing powder without any reduction in the quantity of non-bio-degradable tenside. The media coverage of sustainable development plays often to an audience who are, *confused by the notions embraced in its theory, it suggests unwanted sacrifices on the part of citizens, or people just don't trust its ideas.*

Unfortunately, to many sustainability is cast as a "thing we do" or a "program we carry-out" rather than a way we reason and a way we choose to live. Sustainability should be viewed as a philosophy, or ethic, affording people the ability to consider long-term consequences of actions and to think broadly across issues, disciplines, and boundaries.[49]

Expanding and Redefining Sustainable Development

If sustainable development is a philosophy of balance, of recreating it where the balance fails, and of maintaining it where the balance is fragile, the question is re-iterated as to what we are to balance, and how we are to achieve this?

The natural environment has already conclusively shown its own ability to restore balance if left sufficiently undisturbed. Natural forest fires, sequential flooding, volcanic eruptions and resulting lava flows are testament to the ability of the natural environment to win back a balance. The forest fires are necessary for the propagation of the giant sequoia trees in Northern America. The flooding River Nile has brought fertility to the plains of the Nile

48 Extract from Michael Alexander's report, Frameworks for Sustainable and Restorative Economic Activity in the Scottish Borders, to the Edinburgh Sustainable Architecture Unit

49 Extract from Dr. Warren Flint written as a response to the World Bank Internet conference on Knowledge in 1999

Delta for thousands of years, and the brief period of destruction has continued to form the foundation of the livelihood of thousands of animals and people. *Such stability of natural ecosystems generally connected with the idea of "ecological equilibrium", has engaged the makers of ecological theory for years.*[50]

The problem we are now facing in the environment is the sheer scale of man's destructive influence. Without some form of regulation, the natural environment cannot cope. Agenda 21 favours attacking the problem through forty points: reducing and removing the source of immediate environmental threats, and empowering and educating those people most close to the source of risk and most at threat by environmental destruction. It seeks to implement a set of regulatory rules designed to alleviate and remove the factors, which led to the destruction of the environment by human populations in the first place.

This approach has been criticised largely due to the enormity of the task; in effect, the entire global community should operate according to a shared set of values, which govern all cultural activities according to sustainable development.[51]This can only be considered an ideal not necessarily worth the realisation. The cultural loss and conflict resulting from the imposition of some universal set of standards would no doubt be immense, particularly if those powers used to exerting their authority on the world stage were to draft these rules.

In the beginning, man was shaped by an environment, which acted as selecting agent and controlled the evolution of his present features. Throughout the period, man, like other animals, remained in equilibrium with his environment. But then man developed culture and thereby shattered this equilibrium... From that time on man had exerted an ever-increasing influence on his environment.[52] There is a common belief that all culture has

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50 From Zukunft für die Erde. Nachhaltige Entwicklung als Überlebensprogramm, Band 1 Sustainable Development was ist das ? Herrenalber Protokolle. Haber, von Lersner, Zahrnt, Diefenbacher, Renn, Rutjens, Halbritter Altner und Feldhaus. ISBN 3ß89674110 1 Page 9

51 Critics such a s Satterthwaite (1996), Schneider (1993), the Herrenalber Protokolle 111 and 109 of the German Protestant Church 1998, Zukünftiges Deutschland 1994, Page 15-19 have expressed this concern.

52 Extract from Wagner, R. Environment and man. W.W. Norton & Co. New York 1974

negatively affected the environment. This approach is most narrow and does not take into account the vast heritage of natural wisdom accrued and possessed by people across the globe. Many well-documented illustrations exist; Benjamin Lee Whorf [53]for example used the study of the Hopi language to gain access to the profound relationship the Hopi shared with nature. Mary Ellen Tyler[54] explored the 'spiritual stewardship' inherent in the culture of the Gitskan folk, Wet-su-wet in Northern America. Jean Liedloff[55]analysed the culture of the Yequana Indians in central Southern America.

These three examples from many illustrate the shared understanding of environment based on an innate relationship with nature.

Returning to Liedloffs' *continuum,* which she defined as: *Experiences corresponding to expectations and tendencies in an environment consistent with that in which these expectations and tendencies were formed.*[56]Liedloff extracted several aspects necessary to achieving this:

Children need to go through certain expected and required experiences.

Such experiences should be provided from one generation to the next by the environment surrounding the children. This environment must be compatible with the collected human experience, resulting from a long-term dialog between themselves and nature.

Unlike the assertion above, which refers to the western cultural paradigm, these people shared a love for their environment, which influenced every action. The wealth and beauty evident in the bodies of myth and ritual assert that this relationship was not simply the work of a survival pitted against the extremes of the physical environment. This love exuded from their holistic cosmology. These people saw value in every expression of life, acting as a facet of the creating force which holds the universe together. Where our culture of the Northern Hemisphere suffers is in the profound separation of man from this

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53 Whorf, B. L. Language Thought and Reality. Edited by John B Carroll. MIT Press USA 1965 Pages 134-159

54 Tyler, Mary Ellen. Spiritual Stewardship in Aboriginal Resource Management Systems. Environments. May 1994

55 Liedloff, Jean. The Continuum Concept. Arkana Penguin Group. 1986 (first published 1975)

56Liedloff, J. 1975 Page 38

creation, we can no longer share in the consciousness of the ecology around us. This originated in philosophy, infiltrated religion, spread its way to science, and has become the wayward governing principle of our culture.[57].

When man sees himself as separate to, above or outside of natural systems, it is hard to grasp the source of necessary repair. The cultures of the aboriginal Amerindians showed how it is possible, with another consciousness, to exist in equilibrium with the natural environment.[58]

According to Johnson's[59] *grey-green scale* of sustainability there are three choices for addressing our impending environmental catastrophes: At the *grey* end of the scale, we continue our existence as before, maintaining economic growth as a measure of development. We could, alternatively head the *grey-green* contingent who, prophesise that all problems can be solved from within our current paradigm; all we need do is to apply our brightest and best scientists to the task at hand, and man will find the solution.

The third party is viewed as radical. They see the arrogance in such assertions, and say that only through a readjustment of our cultural consciousness to redefine values more attune to the laws of equilibrium governing the natural environment, can we survive and develop.

Needless to say, there exist many shades of green in-between. Whilst Agenda 21 pinned its hopes on the ability to affect change through education, it also allowed room for the positive effects of the development of new technologies – the solar power industry is a case in point. Assuming the *green* end of the scale is the most likely to achieve equilibrium it is necessary to explore the tools, which can be used to readjust this consciousness.

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57 For thorough investigation of this progression and origins, see Capra, The Turning Point, and Wendezeit im Christentum. (Turning Point in Christianity) 1997

58 See Chief Seattle Wir sind ein Teil der Erde. (We are a part of the Earth- Chief Seattle's speech to the Americans)

59 Johnson, C. The Green Dictionary: Key words, ideas, and relationships for the future, Macdonald Optima, London. 1991

The following chapter on learning explains how much of our primary knowledge is acquired. This learning would have to be directed towards achieving the close understanding, which our ancestors employed in their daily interaction with the environment; the necessity of regaining balance between the environment and man, could rekindle the forms of knowledge acquirement which once formed the foundations of our culture.

Chapter 3

What is Learning ?

To reach an understanding of the process of learning, the author turns to the literature of Jean Piaget. A psychologist, famous for the quality and quantity of his work on the growth and development of children, *Piaget's genius for empathy with children, together with true intellectual genius.... has caused him to be regarded as the outstanding child psychologist in the world today.*[1] The process of knowledge formation, and the developmental stages of the child will be explained in this chapter.

Learning is the process of knowledge formation. Knowledge is formed through a synthesis of environmental stimuli, perception, and action. Jean Piaget2 describes this process of systemic interaction of the child within his environment: The environment is comprised of potential stimuli, a child chooses to expose itself to certain types of stimuli based on the accrued experience of learning since conception. This gradually achieved learning has led to the formation of perceptive structures. The child then perceives a stimulus, and the perception is accompanied by an action. We can illustrate this; a child may shut her eyes in re-action to the perception of a bright light, he may drop a soup spoon, which upon touching, his hand and mind have registered as hot etc. The action engaged in by the child, forms knowledge through the perception he forms of this action. Piaget's findings suggested the strong link between action and perception in knowledge formation, a fact that had hitherto been ignored. He stated, *In fact one does not understand the properties of an object except by acting upon it and transforming it.*3 Piaget, Elkind and others have since developed the implications for the manner in which we educate children further.

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1 Elkind, David. Children and Adolescents 2nd. Ed Oxford University Press 1974 ISBN 019 501816 8

2 Piaget, Jean. Psychology and Epistemology. Towards a Theory of Knowledge. 1972. Penguin University Books. Translated from French by P.A. Wells.

3 Elkind, D. Page 45.

This, 'transformation' of an experienced stimulus can be achieved in two differing ways, *One consists in modifying its positions, movements or properties in order to investigate its nature* and, *the other consists in enriching the object with new properties or relations, completing them, however through systems of classification, ordering, placing in correspondence, counting or measuring, and so on.4* This act of perception, which gives a layer of meaning to an experience, is known as learning. This is what children engage in on confronting their environment. The child develops, amends and builds on what often look to us as inanimate and undesired objects. They build upon the direct experience of an object or observed incident, by transforming its status to fit their own internal purpose. This interaction of the child with the environment has implications for the kinds of education termed, *experiential learning* and, *active learning*.

Learning in the European context is seen as a social duty, carefully encouraged and directed by the state run institutions. The institutional establishments of schools, kindergartens, colleges and universities carry the burden of education and the responsibility for conveying facts and value systems through both nominal and active student participation.

Perception:

We have already seen that perception is a cumulative process. Over time we have an increasing diversity of interactions with our environment, which form new perceptive structures within the mind. These are labelled cognitive structures. *At the very least, perception depends upon the basic physiological systems associated with each sensory modality, together with central brain processes that integrate and interpret the output from*

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4 Elkind, D 1974

*these physiological systems.*5 Piaget argues that perception is not simply the result of a stimulus from the external environment but is directed by the internal structure of the individual in her stored mental archive of expectations and hypotheses. These can be labelled, *anticipatory schemata*6. These, *prepare the perceiver to accept certain kinds of information rather than others and thus control the action of looking. Because we can only see what we know how to look for, it is these schemata (together with the information actually available) that determine what will be perceived.... Because schemata are anticipations, they are the medium by which the past affects the future; information already acquired determines what will be picked up next.*7 These schemata are formed through the daily interaction with the external environment experienced by every individual. The differences in schemata will be determined largely by the quality and richness of experience available to the individual and her own physiological structure, which influences the receptivity of the individual to these stimuli. An example of the power of this schema in directing perception can be shown through the book, Der Papalagi[8]. This documents the thoughts and impressions which Chief Tuiavii of the village Tiavea in the Samoan Islands formed when travelling through Europe. The images and descriptions he uses for every-day, utilitarian objects of our European civilization are based on his schemata formed living on a remote Polynesian island. As such his descriptions appear to stem from the mind of a young child, ignorant still of the form, diversity and mechanisms of the environment into which they have newly been born. When however he describes his own culture, we observe the mind of a sophisticated adult.

The forming of constructs or mental maps of the world, based on the way we see, sense, experience and therefore perceive it, is completed in a physical manner within the brain.

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5 Ujam, Dr, Faozi. Ecology, Culture and Cognition. A text book on the principles of environmental design. Ph.D. Thesis Heriot Watt University / Edinburgh College of Art 1987. Page 113

6 See Ulric Neisser 1976 In Ujam 1987

7 Ujam, F. 1987

Pearce9 describes perception as the combination of: the dynamic two-way interaction of brain cells within a neural field, coupled with the two-way interaction of neural fields operating with each other. The sum of these interactions forms a united energetic stream, which combines with many other similar neurone systems and produces the phenomenon known as perception.

Pearce goes on to illustrate how fixed structures or pathways of perception, known as constructs, are formed. Using the example of the development of language Pearce explains how the brain forms pathways of energetic exchange within the brain. The pathways correspond to perceptive experiences. Language contains words, which are endlessly repeated and these repetitions build up as firm pathways of neurone interaction within the language centres of the brain. The more these pathways are utilised they are coated with a resistant chemical (Myelin) which protects them from the regular 'spring-cleaning' activities occurring in a child's brain. Through repetitive use, these pathways are protected and become established. What is interesting here is the effect of repetition on learning and the facilitating role it plays in learning. Repetition is a key concept in the work of Maria Montessori who integrated it into her own form of active learning through controlled sensory stimulus. Her work has formed part of the core of what is now labelled *active learning*10.

By the time a child enters the formal educational process she will have constructed a huge web of complementary perceptions about the world which with sufficient repetition, become cemented into the mind as mental constructs. Previous to Piaget's findings, the child's mind was viewed as an, 'empty slate' onto which education was to be imprinted and it is

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8 Der Papalagi. Die Reden des Südseehäuplings Tuiavii aus Tiavea. (The Papalagei. The Speeches of South Sea Chief Tuiavii from Tiavea. Tanner and Staehelin Verlag 1977

9 Pearce, David C. Die Nächste Schritt der Menschheit. Die Entfaltung des menschlichen Potentials aus neurobiologischer Sicht. 1997 Arbor Verlag. Original American title: Evolution's End.

10 Maria Montessori, the Italian doctor who set-up a system of kindergartens based on didactic, active learning, which are now spread world-wide. See also Hart, Roger. Children's Participation. Earthscan / UNICEF 1997. Pages 62-63. This includes some examples where this learning method is applied. See also Wild, Rebeca for her documentation of the Pestalozzi School.

this view which still dominates much of the traditional educational practices today. Eysenck11 wrote: *Thereafter, rehearsal serves to maintain information in the short-term memory, and some of that information is transferred to the long-term memory store*. This is the learning, which dominates the classroom need for reading about, writing about, and being examined on a subject where it should eventually reach the status of long-term storage. What Ujam12 stresses is that *such a view cannot readily accommodate other cognitive activities, such as thinking or problem solving*. The 'thinking' ability has to be provided by some other form of interaction. It is this interaction which Piaget has labelled 'active learning' and which will be explored in more detail below. Piaget's findings have given us a small window onto the workings of a child's mind. If, as Brian Little13 pleads, *it is mandatory to inquire into their own particular system of constructs* in order to form any realistic understanding of a child's relation to her environment, then it is necessary to understand the process of perception formation.

The Stages of Learning in Children

Piaget outlined three stages of learning which children go through on their path to adulthood: *operative, figurative* and *connotative*. Each of these challenges and builds a different field of learning. Operative occurs from the beginning of the child's existence and continues to the age of seven. Figurative spans the time from seven to twelve and connotative spans from eleven or twelve to the end of the teen-age years. This last learning type can be seen as more of a synthesis between the two former types. Piaget notes however, that there are overlaps between the stages, which seldom occur in

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11 Eysenck, M. W. A Handbook of Cognitive Pszchology. 1986 Pages 23 - 27

12 Ujam, Dr. Faozi. Ecology, Culture and Cognition. A text book on the principles of environmental design. Ph.D. Thesis Heriot Watt University / Edinburgh College of Art 1987 In his discussion of the various schools of perception and cognitive science. Page 109.

13 Little, Brian. The Social Ecology of Children's Nothings. In EKISTICS Vol.47 No.281 March/April 1980. Athens Centre of Ekistiks, Athens Technical Organisation, Greece ISSN 0013 2942

isolation. As Ujam14 suggested, this division between figurative and operative learning is an enabling tool in understanding the difference between perception and cognition. Using Piaget's definition of figurative and operative learning, Ujam states, *figurative, (*is*) related to the percepts or images of successive states or momentary configurations of the world by direct and immediate contact. The second (aspect of knowledge) is essentially operative, related to the operations which intervene between successive states and by which the subject transforms parts of the world into reconstructable patterns of schemes: visual perception is only one form of figurative knowing, while cognition is based on the operative mode*. The two learning processes which pertain most to the study are the operative and figurative, as the examples selected are restricted to this age range.

Operative Learning:

What is operative learning and what can it tell us about the child's relation to her environment? The following is based on a text written by Rebeca Wild15, in her wish to clarify the process of learning to parents and educators. She argues that without the possession of conscious knowledge about child development it is impossible to create a learning environment conducive to the child's needs. All her assumptions are based on the findings of Piaget's empirical studies with children.

Operative learning is the foundation of the other two learning modes. It occurs only when a child interacts in an independent manner within a variety of different life situations and, allowed to experiment freely with tangible elements. When he is able to constantly restructure and reform these materials according to his own needs through work and play then his learning will always be a process of discovery of something which was previously

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14 Ujam, Dr. Faozi. Ecology, Culture and Cognition. A text book on the principles of environmental design. Ph.D. Thesis Heriot Watt University / Edinburgh College of Art 1987 Page 110

15 Wild, Rebeca. Drei Arten zu lernen. Fortsetzungsreihe Teil 8. Mit Kindern Wachsen. Heft 4. Oktober 1998. Much of the text used above is a free translation.

hidden. Joy or feelings of pain accompany the process, and the whole body with all its sensory facilities is activated towards this process of discovery. Operative learning does not involve learning from anyone else; it is pure self-discovery. The child engages her faculties of understanding and the ability to apply the intelligence of perceiving and analysing to address problems. This type of intelligence exhibits a high degree of autonomy in the ability to make decisions and to take responsibility. It also enables problems to be solved on a co-operative group basis.

The three defining characteristics of operative learning are: quality comes before quantity, horizontal learning processes are favoured above vertical learning processes, and the absolute precedes the relative. These three points are explained below: Before a child can embark on the use of any didactic or structured material, she must have had sufficient experience of non-structured material where the child could assemble enough mental pictures of her experience to allow her to approach anything with an inherent order. She must first form the necessary perceptive structures to enable her to approach tasks of increasing complexity and diversity. The horizontal learning is an integrative approach, which allows for the incorporation of many diverse elements during learning. This is systemic thinking, *the scientific terminology for ecological ideology*16.

The absolute precedes the relative: at this stage of learning, the child can only view his world as a series of absolutes. The ability to reason and to colour the perception with varying shades of grey develops later. This has implications for the manner in which knowledge is imparted. If we attempt to force our own mental structure and our own perception of the world onto the child there will be no real understanding. Whatever 'knowledge' is imparted in such a manner will also have no foundation within the child.

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16 Capra. Fritjof and David Steindl-Rast. A Sense of Belonging 1991. From the German version, Wendezeit im Christentum. Dtb Verlag 1994. Page 106
A research thesis into the identification and content of an, " ecological school culture" is being undertaken by Rachel Dempsey at the Bildungswissenschaftliche Hochschule Flensburg Universität together with the Institute for Pädagogik der Naturwissenschaft, Kiel. Germany

It is clear from this understanding that operative learning involves a relationship between child and environment. The quality of this environment and the suitability of its contents are decisive factors in developing internal cognitive structures. Additionally, the ability to work with the elements in this environment, to manipulate, change, and re-combine are essential attributes if we are to encourage this type of self-reliant, independent and responsible learning.

Figurative Learning

This is the stage of learning, which concerns itself with the formation of symbol and metaphor. Learning a language is one of the many cultural skills adopted through this type of learning. Wulf's17 paper on mimetics describes this type of learning as, *to emulate, to resemble a person or thing, to express oneself, to portray something to someone.....Ones' bodily deportment, behaviour and responses are comprehended and remembered as images, tones and sequences of movement. They become part of the internal image, sound and movement library, which when newly combined with the active transformations of imagination can be used in life.*

How is this achieved? By imitating the many symbolic expressions, which the child is constantly confronted with, the symbols gradually become the internal possession of the child. This kind of imitation is instinctive, and sub-conscious, and is a function of the necessity to live in harmony with their environment.

Without the experience gained in the operative phase of learning, these adopted symbols have no anchor within the child. They still adopt the cultural symbols existing in their world,

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17 Wulf, Christoph. Mimetics and Ritual. Developing a Social Sense. 1995 Paper given at the Freier University, Berlin.. Mimesis in Gesten und Ritual. In PARAGANA International Zeitschrift für Historische Anthropologie. Band 7 1998 Heft 1 Seite 241-263.

but without the necessary perceptive structures to ground these within their internal cognitive structure.

Connotative Learning

This is the fusion of figurative and operative learning, which allows the child to reach out into an ever-expanding field of knowledge. The cultural symbols, which the child has copied, become coupled with operative experience; words can become attached to their meaning. The process of learning occurs as the child's own experiences begin to be coupled with a cultural meaning. Play becomes the highest form of intellectual exercise; especially if experience with structured material is accompanied by the child's own commentary.

*Play is serious work for children. The child develops his intelligence, his creativity through play. Play contains the outline of his human existence. The child is the designer of the man, and there is no one who was not fashioned from the child that he once was. Play is the central and every-day expression of a child's life, through it; he draws gradually closer to the world.*18 This is no less than the child understanding the meaning behind his actions.

If a child has been allowed to develop in this natural way within a suitable environment, then she is forming the ability to see the consequences of her action. The implication therefore of Piaget's work in the learning stages of children has application for the ability of a child to exercise responsibility for her environment.

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18 Schaefer, Norbert. Wasser und Natur Erleben. Ökologisch orientierte Spiel und Erlebnisräume.(Ecologically -orientated play and adventure grounds) Ministerium für Umwelt und Forsten. Rheinland Pfalz. Mainz. 1997 Page 14

Models of Learning

The following section refers to different models of learning. The examples are predominantly non-mainstream, although elements of their theory have been introduced in an often piecemeal and therefore ineffective way into the traditional educational structures. Through this appraisal we gain an understanding of contemporary movements which have addressed the issue of evoking an environmental consciousness.

We all have heard of vandalism, of inner-city violence, child abuse, child criminals, learning deficiencies, school dropouts and other maladies currently blamed on the educational system. The scope of this study is not to evaluate the strengths and weaknesses of this system, but to identify where it is, and how it is that perfectly ordinary children are able to develop a caring attitude to their environment, which will remain with them for life. The following three sections explore three fields where this caring attitude is apparent.

Experiential Education

Piaget's work that defines learning as experiential sensory stimulus; perception and action, entwined within a matrix, which forms the pattern of subsequent action and perception. 'Experiential education' is concerned with the provision of hands-on sensory contact with whatever stimuli, are to be investigated. Below are two illustrative examples:

Two seven-year-old children look at a tree. One sits on the sofa at home, in front of the television; he is looking at a large jungle tree as the camera slowly pans its way up the gnarled bark, brushing aside tree ferns, disturbing the roosting birds. The child can see the insects running up and down the bark and hear the taped sound of the wind passing through the leaves. The pictures are beautiful and rich.

The other child stands at the base of a tree in the middle of a field. The huge Beech tree holds its branches low to the ground. The child swings onto one and begins to make her

way up through the branches. The lichen-coated bark scratches against her face, but her legs push her up onto a safer branch. She is sitting in the fork of a branch, filled with the scent of crushed leaves, slowly mouldering bark, her hands clasp around this bark, warmed by the sun. An ant crawls over her finger.

Which is experiential? For the child, only the second example will count. Which child will retain the memory of their tree for the longest? The second child. Which child will use this experience when faced with another tree, to climb? The second again. We have seen how this learning works. What we are beginning to see is how an affinity can be formed.

History of the Experiential Education Movement

After experiencing defeat at the hands of Prussian soldiers in 1864, the Danish people instigated an educational reform based on the writing of Nicolei Grundtvig19. His aim was for *young Danes to learn to inquire and to think for themselves.* The tenets of these, *Schools of Life* were, *build on one's experience, learn from experience, be proud of one's native culture, the spoken living word was better than dead books, learn from each other, respect and gain knowledge of one's own land and the environment. The purpose of education was... to teach people to become better citizens for a democratic society, classes were not mandatory, and one had to be a willing and mature student, motivated enough to act independently yet responsibly.* It was this movement of 64 schools, which is credited with having taught Danish farmer's new agricultural techniques and which led to the development of their famed system of co-operatives.20

One man from among these pupils, Jens Jenson, who later became the renowned American landscape architect), took the idea with him across the sea to the United States.

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19 From the Ph.D thesis of Patricia Takemoto, entitled, 'The Clearing and Danish Folk Schools' 1992 University of Wisconsin USA.

20 Taken from the above mentioned thesis.

In 1935 Jenson established, 'The Clearing - A School of the Soil'. Although this was created for adults, the principles remained constant. Jenson intended to, *give them an appreciation of the real things.*

Although in a manner more akin to authoritarian education, Frank Lloyd Wright sought to fill this gap of physical experience among his architect apprentices by building Taliesen East and West.21 Here, his apprentices were encouraged to sketch, play in and work with the elements of the natural physical environment, which were in abundance at the two sites chosen. This approach to learning was supremely different to the intellectual studies normally considered a prerequisite for building architecture. In its manner and freedom it approached the 'Bloomsbury' movement which occurred simultaneously in England.

Although these examples are restricted to the adult world, their existence and the work of Dewey22, Montessori and others23 have led to the establishment of the phenomena of experiential education.

The German Experiential Education Movement

The theme of regaining our connection to the natural physical environment through active interaction has given birth to an increasingly powerful movement of activists within Germany. Planners and those involved in transmitting and planning the education of children are beginning to incorporate this experience of the natural environment into their work.

The work of Goethe24, and of Rudolf Steiner25set the historical scene for a well developed environmental consciousness. Germans are generally said to have *the most developed*

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21 Reference from "Taliesin and the Clearing: A Comparison of Two Schools. Virginia Russell February 1995. V. Russell is professor of Landscape Architecture at the University of Cinncinati USA.

22 Dewey, one of the major reform educators of the last century.

23 For further reference, see Pestalozzi, Froebel, Peterson, Malaguzzi.

For further notes see overleaf

*environmental consciousness of the developed world*26. The reason however for current levels of pollution and huge consumption is that this awareness remains the territory of the brain and does not filter down into action, unless certified by directives from the political power.27

The alternative movement, supported by the political beliefs of the Green Party, preaches a more 'bottom-up' approach. This is manifested in education by a returning trend to including the maintenance of a school garden for fruit and vegetable growing28. Schools all over the country are sprouting ponds, mini biospheres, tunnels made from living willow, window boxes and in some cases outdoor classrooms. Many of these improvements are purely cosmetic and aimed at improving the image of the school, in an increasingly competitive environment; each school is vying for the dropping number of potential pupils.

There do exist however, approaches to raising awareness of the environment through direct experience. A small number of planning offices, have begun to be aware of the potential for participatory design in planning areas used by children. Following their instincts, they have created a rich foundation of planning experience within the physical environment. As a result of several studies conducted29, these planners have developed ways of working with children in the planning, realisation/building, use and maintenance of their play environments. The direct experience of working on all these layers becomes an

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24 Johann Wolfgang Goethe wrote huge quantities about the natural physical environment in the period 1773- 1832 His affinity with the term Genius Loci, (the Latin words for the hidden meaning or spirit of a place) is synonymous with his integrative approach to studying physical phenomena.

25 Steiner was the pioneer of the anthroposophical movement, which sought to give an order to all forms of life. A form of religion (sometimes referred to as a dogma), Steiner's explanations of the facets of life, of their interaction and interdependency were an early form of systemic thinking. His philosophy gave rise to the 'Waldorf' Schools who, since 1919 have sought to make these relationships between man and his environment known to its child pupils through the taught curriculum.

26 Newspaper caption from Die Zeit. August 1993

27 The recycling system of the, 'Grüne Punkt' where all plastics and metals used in commodity packaging are collected for recycling is an example of such a directive. Education drives are still required to ensure that all consumers understand the rules of what is to be recycled, but largely this scheme has been successful.

28 This had been a strategy long incorporated by the socialistic Government of the former East Germany. Ref. Uschi Kettle and Frau Buchow Headmistress of the Rathenau School, Weimar.

29.In the case of STADT + NATUR, the office most discussed here, they gained much experience during their work as development helpers in Haiti, working for the charitable organisation, MISEREOR.

extremely powerful tool in the formation of the child's constructs of her role within that environment.30

Some brief excerpts from the ever-expanding literature to the theme of the child's use of the physical environment serve to illustrate the assumptions governing this kind of experiential learning. *With environmental experience, the issue of knowledge transmission takes on a lower priority compared to the use of time and the space to enable personal relationships towards this environment to form.*31 This use of the space through, *movement, play, creative organisation and other modes of expression*, can become, *a way to digest experiences, to develop new ideas, and to connect the personality to her environment.* Langer, Blessing and Fladt argue that in today's post-industrial civilisation, *contact with nature must become an increasingly conscious act.* The daily integration of household and agricultural chores, which took up a large part of the child's day at the beginning of this century, made such conscious knowledge irrelevant. Previously there was no choice about the child's connection to his environment. Then there was a stage of little or no connection, and we are now at the point where we can choose to form a connection.

The conscious relationship afforded by this kind of direct experience activates a type of environmental protection consciousness. Children are free to experience, they see how a caterpillar develops into a butterfly, and henceforth they have a wish to protect caterpillars, to find out about their process of metamorphosis and so on. Planners are involved in

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30 Some of the planners can be listed here: STADT + NATUR their work has received many awards, and commissions to formulate new laws for safety for children's play based on the philosophy of experiential learning, and directives for the Land of Rheinland Pfalz for the design, building and maintenance of areas for use by children.

BAGAGE, Paedagogische Ideenwerkstatt e.V. Udo Lange – Thomas Stadelmann. Authors of Spelplatz ist Ueberall (Playgrounds are everywhere) Herder 1996 ISBN 3 451 23757 1

Additionally, the Lehrgarten der Akademie für Naturß und Umweltschutz Baden-Württemberg is a centre where children can make this kind of environmental experience.

31 Natur erleben mit Kindern. Karin Blessing, Silvia Langer, Traude Fladt. Ulmer Verlag. (Experiencing Nature with Children) 1997 Page 9

structuring the environment into a rich arena for experiencing ecology first-hand. There are several centres, which attract school and kindergarten parties for short term experience32.

These centres aim to provide a rich structured environment containing a diversity of unstructured natural material, which affords contact, play and invite activity of all kinds.

This kind of activity and environmental design is also seen as a setting for therapy. The diversity of experience facilitates healing processes in disturbed or disabled children, as they wrestle with the bounty of the environment and their own impediment to movement, thought or development.33

What is interesting is that these driving assumptions are almost identical to those based on Piaget's work, which have given direction to the academic school of Active Learning.

Active Learning

Maria Montessori said of children, *You have heard what people say: school the children early. Standardise them. Make them perfect and adult. I am telling you: children are full of beans! Help them keep their happy jumping. Explore life with them.*34Whenever children learn they are bound to use this energy, they are not naturally passive absorbers of education. David Elkind35 said, *young children are 'active' learners, this must be taken in a literal sense. It is the reason, for example, that Montessori said that "play is the child's work." In play, the child is practising the various actions that will eventually be internalized as thought..... what children acquire through active manipulation of the environment is nothing less than the ability to think.*

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32 Notably, the Ökozentrum and Britzer Garten in Berlin, Schloss Turnau in Brandenburg, Wolkow Ökospeicher near to Frankfurt an der Oder, the Akedemie Lehrgarten in Baden Württemberg and the planned Stadt+Natur Mühle in Landau, Rheinland Pfalz, which plans to cater for parties who spend a weeks' sojourn.

33 See Spielplatz ist Überall. Lebendige Erfahrungswelten mit Kindern planen und gestalten (Playground is Everywhere: Lively Experiential Worlds Planned and Built with Children) By Udo Lange and Thomas Stadelmann. The article on page 109 by Gertraud Finger.

34 Quoted during a seminar for Kindergarten training 1994. Attended by Bettina Bochaneck - Kindergarten Teacher.

35 Elkind, David. Children and Adolescents

Piaget formulated his goals of education, *to create men who are capable of doing new things, not simply of repeating what other generations have done- men who are creative, inventive and discoverers.* His second goal, *to form minds, which can be critical, can verify, and not accept everything they are offered.* In order to achieve this, Piaget felt, *we need pupils who are active, who learn early to find out by themselves, partly by their own spontaneous activity and partly through materials we set up for them; we learn early to tell what is verifiable and what is simply the first idea to come to them.*

It is the potential to facilitate this, which the author hopes to be able to find in the analysis of children's environments.

The Tenets of an Active School

The following guidelines for an active school are culled collectively from the work of Maria Montessori and the Wilds in their active school, the Pesta. These guidelines are compared to a system of learning (evolution) which is ecological. Quotations are taken from an interview with Rebeca and Mauricio Wild36, conducted in the summer of 1999. *The child is in possession of his own 'internal clock'37*Mauricio Wild calls this 'clock' the 'structure' and the outside world is 'chaos'. Through the interaction between the perceived external world, and the guiding internal world, the knowledge structures are formed.

The environment is so conceived that the child will find all that he needs for this activity. The environment additionally contains a huge range of unstructured material, free for use and manipulation. The environment also contains opportunities for structured learning - didactic tools, isolated sensory stimuli, which can be chosen according to the child's

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36 Quotation taken from an interview with Mauricio Wild, (1999) co-founder of the Pestalozzi School in Ecuador and active with Rebeca in giving seminars throughout Germany, Austria and Switzerland on the subject of life processes in children.

37 Piaget used this thesis of each child owning its individual time scale for learning. Wilds and Montessori and other educators of the "Freie Schule" movement in Germany, and others use this metaphor to explain the internal structure of the child, which governs learning processes.

developmental needs: *The child may undertake the activity of her choice. Freedom is not to be mistaken for unchecked self-indulgence or for a freedom without limits.*38

Obviously, the prepared environment is only functional if limits are present and -if necessary- made explicit in a respectful manner. Social limits experienced in this way make the needs of others evident. Even though they will be painful, they can be integrated if the own growing needs of the child are fulfilled. As children grow, they participate actively in the making of their own rules, thus fulfilling the developmental needs of the operative period and taking responsibility in what corresponds to their stage of development.

-In our experience, children who have grown up in this framework, not only co-operate naturally with others, but when they become adolescents have a deep sense of responsibility for society and the earth that sustains our life."

This recognition of a learning process which can naturally imbue children with a sense of responsibility towards themselves and their earth requires greater consideration for this study. The Pesta school is analysed below:

The latest work of Fritjof Capra, The Web of Life39, provided the fitting structure for analysis of this educational approach. The Epilogue is entitled ecological *consciousness*40 and sets out Capra's pre-requisites for a vital ecological awareness. Capra himself states that the principles of ecology must be understood and used as the principles of education, politics and management. His thesis has been divided into sections, each part triggering the analysis of the Pestalozzi School educational approach.

The first of Capra's thesis statements reads:

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38 Montessori, Maria. Kinder sind Anders. (Children are Different) 1926

39 Capra, Fritjof. The Web of Life - in the German version "Lebensnetz" 1996 Scherz Verlag

40 Capra 1996, pages 343 - 351

Living systems, which form the basis for ecological consciousness, are 'networks operating on a closed system of organisation, but which are open for the flow of energy and resources'.

The Pestalozzi school contains three entities, kindergarten for ages 3-6, Primaria 6-12 and Secondaria 12-19 years. The school is set within the small town community of Tumbaco in Ecuador. This wider community also forms and informs the learning development of the children attending the school through close co-operative projects in the fields of agriculture, carpentry, social community work and internships arranged with a wide variety of businesses.

Each of the school's three units has its own forum of democratic decision-making but there are links between the entities. In the spirit of participation, all the children of each group assemble at least once a week, with their teachers. Each member has equal right to speak with a rotational chair. Decisions, punishments (for overstepping the few but firm rules), praise and suggestions are made jointly using majority vote. The entities are self-regulatory except for major or unresolved issues, which get carried over to a general decision-making body constituted of representatives from each entity.

Teachers meet regularly on their own to present observations, discuss unresolved problems, and to gain inspiration for new learning materials and resources. Parents meet with the teachers at regularly scheduled information evenings when a certain topic, (such as the viewing and impact of television on children) is discussed. They also meet individually, at the parents' homes to discuss the needs of the children and to gain an image of the life the child is leading outside the school. Parents are actively brought into the organisation additionally through arranged field trips to workplaces, and donated or exchanged goods and services.

The curriculum of the school does not exist as such - it is instead re-defined as the *prepared environment*41. This consists of diverse materials for learning and experience to satisfy all five senses. The material is sorted into *structured* and, *unstructured material*42presented within the structured physical setting of the school. The flux of incoming and outgoing material is dependent only on the veracity of the child's hunger for learning.

Thus the first elements of Capra's words are fulfilled. A fixed social and physical core structure which through a system of greater or lesser permeable membranes allow an influx of new material and flexibility in dealing with the development of the child.

Capra names his five principles for ecological consciousness; *reciprocal dependency, cyclical flow of resources, co-operation and partnership, flexibility and diversity.* We can name the elements of the Wilds educational system, which approach this model:

Reciprocal dependency

This can be explored in terms of the learning process of the children. Each element within an ecological community is mutually dependent on another. The qualities of each element can only be seen through the relationship to other elements.

When a child in Pesta becomes interested in measuring height, she may look at her own body. Seeing other children near her she may compare her size to theirs. Following this, she may proceed to measure with a ruler, to chart heights upon a blackboard, to make a scale model with clay, to seek similar ratios observed in her classmates' height, in pouring water into various sized bottles. Once she has grasped the concept of an observable *difference* she may continue to explore the implications for several weeks. Moving from height to weight, to volume to density, exhibiting a deep appreciation for the diversity inherent in a principle of matter, which she has revealed. The thought would never occur to

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41 The following books written by Rebeca Wild have been used as the basis for this analysis : education for being, Cambridge Press 1990, Sein zum Erziehung, 1991 being for educating), Grenzen und Liebe, Freiheit und Respekt (Limits and Love, Freedom and Respect) 1998. In addition the seminar of September 1998 given in Berlin by Mauricio and Rebeca Wild, with Anna Tardos of the Loczy Institute, Budapest, provided additional information.

42 See education for being page 62

the child to study height as an isolated phenomena, simply to be measured against a ruler and left in the abstract realm of centimetres. In a learning situation such as this, where the child is free to take from any material he wants (in accordance to some firm but basic rules designed for the respect of the persons and things within the school), there is never any need to restrict the world of knowledge to static, isolated principles. This encourages systemic thinking.

Cyclical flow of resources. Capra illustrates this principle with an example of ecological tax reform - a method of monitoring consumption and of assigning value to attributes of industry, which conform to a sustainable ecology. This, he argues should ensure the sustainable use of resources.

The Pesta uses the already discussed democratic forum to maintain the social equilibrium, and the use of its rules such as *each material is to put back in its place at the end of its usage. No child is to interfere with the work or actions of another unless they are invited to. All children are to go home at the end of the school day*! These act as deterrents to prevent the overuse or abuse of the learning environment. The input or throughput of resources is also supplied from the wider community. The involvement of parents can progress to the creation of co-operative programs for direct learning experiences within the trades, industry, businesses and social spheres of the community of Tumbaco. These adult institutions gain insights from working with the fresh impulses of the children, and can sometimes exchange this service to reduce the sum paid as fees to the school (through the LETS scheme43).

Co-operation and partnership; this is something which is built into the Pesta structure. The physical structure of the learning environment is conducive to movement and exchange between individuals and groups. If two children are occupied with building a sand model of the varying heights of buildings in their village and another group has set themselves the

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43 L.E.T.S. Local Exchange Trading Systems, a Scheme of non-monetary exchange. See for example Letslink UK or Planetry Connections No. 5 Autumn 1994

task of documenting the history of this village, there will be a venue for exchange and co-operation. This is formed purely through the facilitating openness of the physical environment. In such an exchange, both sides could learn of small inaccuracies or of additional stories, which serve to enrich the overall experience of learning. Thus, not only is the original curiosity fulfilled, but also the exchange has widened the field for new investigations.

This partnership ideal is taken further in the integration of Indio-Spanish and other native speakers within the school. Literature is available in the school in Spanish and many other languages. Children are usually spoken to in their own language. The culture of the Ecuadorian Indian population is celebrated and opportunity is provided for sharing this through language, dance, traditional stories, medicine and other areas, which the children may discover in the course of their work.

Flexibility and diversity: flexibility is simply explained with the example of the democratic participatory decision-making already mentioned. The diversity of nationalities and languages spoken is also testament to the flexibility of the children here. They may be surrounded by languages other than their own, and yet still possess the ability to concentrate on their own learning process. The discovery and immersion in the culture of one's choice made possible in this learning environment, gives the children greater respect for those of the other liberated children.

Environmental Education

'Agenda for Action - Environmental Education in the 90's' is the title of the work programme for the Council of Environmental Education in the UK44. The brochure sets out the aims of the Council in achieving increased levels of awareness and implementation of

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44 The Council for Environmental Education Programme of Work 1991-1994 Agenda for Action.
"The Council for Environmental Education acts as a focal point for the environmental education movement in England, Wales and Northern Ireland, representing and working in co-operation with over 70 national organisations which make up its membership."

environmental education in all sectors of education and curriculum development. The CEE definition states that environmental education, *should enable people to gain access to, and critically evaluate, information about the environment and environmental issues on the basis of which they can make informed decisions.* And, *be concerned with the development of the skills and personal qualities needed for people to make appropriate responses to issues, and to define their own level of commitment towards the environment.* It should also, *entail the exploration and communication of attitudes and feelings towards the environment, and identification of a sense of place within it.*

The CEE place the role of children in fulfilling this aim at the forefront, *CEE will continue to press for the participation of young people in processes affecting their environment in a European context.* Their aim is for children to increase their knowledge of the natural environment. Most of the schemes sponsored by the organisation are scientifically oriented and could be classed in the category of field study centres. The schemes offer valid experience in the natural environment, but the scientific domination of practice tends to lead to theoretical formulations rather than the development of affinities based on pleasure. The structure of the schemes tends to exclude such subjective associations, with the result that the most powerful motivator for developing long-lasting relationships to the natural environment, the emotional reaction, is unwelcome.

Daniella Tilbury45 describes the current, *knowledge objectives* of environmental education as, *-Knowledge about what it means to be a consumer, and the implications of these decisions on the environment.*

-Knowledge about technological developments and their impact on lifestyles and workplaces and wider environmental considerations.

Her, *skills objectives* follow,

-The ability to distinguish between statements of fact and value about the environment in economic situations.

-The ability to co-operate as part of a team in enterprise activities which may include environmental action.

Tilbury's *Value Objectives* are,

-Develop concern for the use of scarce environmental resources.

-Reflect critically on their own economic views and values and the consequence of these for the environment.

-Develop a sense of responsibility for the consequences of their own economic actions, and a sensitivity to the effects of economic choices on the environment.

The criticism made here is that there is no reference to developing a deeper consciousness on the level of an affinity for the environment. The aims are based on the dominant reductionist model. Tilbury's aims were formed as a reaction to the 1972 UN Conference on the Human Environment in Stockholm where the, *first global recognition of the seriousness of environmental problems recognized the importance of environmental education and citizen-based environmental action.*46

The stress on hands-on participation was assigned a minor role; *it saw this being achieved through centrally directed, 'top-down' environmental education, which was to mobilize societies to act.*47 The inadequacy of such an approach is stressed by the authors of *Environments for Children*, in particular, Roger Hart48: *it is time for a deeper, more grounded involvement of citizens in the environment that builds on their knowledge and*

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45 Tilbury, Daniella. A member of the University of Cambridge Department of Education. Her paper is entitled, A Common Ground: Environmental Education and the Cross-Curricular Themes. Printed in Environmental Education, The Journal of the National Association for Environmental Education Summer 1993.

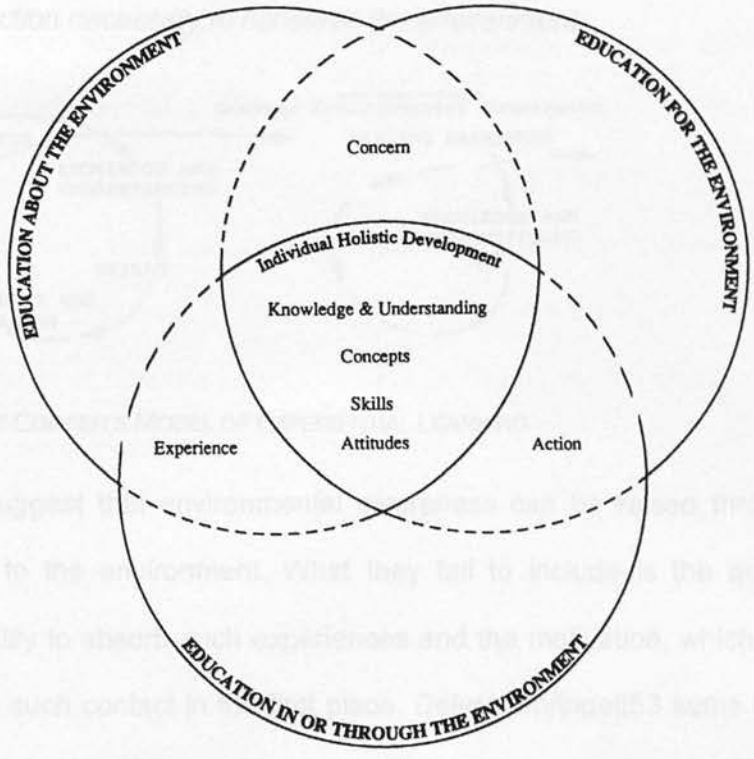
46 From Satterthwaite, Hart, Levy, Mitlin, Ross, Smit and Stephens. The Environment for Children. Understanding and Acting on the environmental hazards that threaten children and their parents. Earthscan 1996

47 See above, Page 245

48 Hart, Roger. Commissioned by the UNICEF (former) Environment Section and Children's Rights Section jointly to produce a book dealing with an extended relationship to the environment, alluded to later in the chapter; Children's Participation.

capacity and addresses their needs and priorities. This concept is referred to *as Primary Environmental Care*, and will be explored later in the chapter.

The outgoing General Secretary (1993) of the National Association for Environmental Education49 expressed the wish to establish a nation-wide forum capable of documenting the successes and methods already achieving success to prevent a, *reinventing of the wheel.* Some theories relevant to the thesis are worth exploring here:



Model For Teaching and Learning In Environmental Education

FIGURE 1 A MODEL FOR TEACHING AND LEARNING IN ENVIRONMENTAL EDUCATION.**50**

This model created by Joy Palmer in 1993 was developed to express which elements would be present in a, *Sound programme of environmental education51* where the onus is on the educator to provide the necessary tasks and experiences. *As a whole, the model*

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49 Neal, Philip. News and Views. Summer 1993 Environmental Education Page 13

50 Palmer, Joy. Senior lecturer in Education at the University of Durham. In Environmental Education Summer 1993. Page 12

51 Palmer, Joy. 1993

forms a basis..for linking a specific topic or environmental starting point into a coherent and progressive overall curriculum plan which focuses on the learner's individual holistic development. She proposed that any scheme for environmental learning should be *in, for* and *about* the environment. An additional model created by Geoff Cooper52 for use in field study centres in Britain promotes the active approach to learning. In, for, about and *through action* is, as he proposes, a means of and a result of rising awareness. He states, *this process can lead to changes in attitudes and values and may eventually produce the concern and action necessary to conserve the environment.*

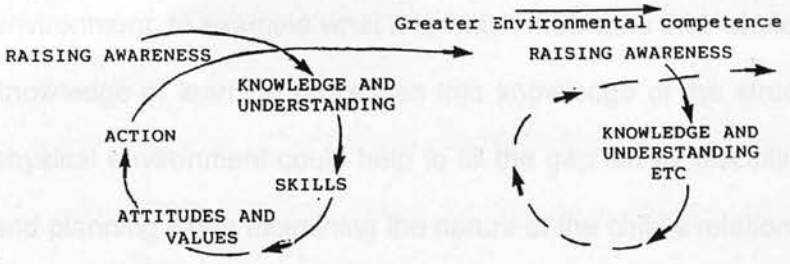

FIGURE 2. GEOFF COOPER'S MODEL OF EXPERIENTIAL LEARNING

The models suggest that environmental awareness can be raised through experiencing direct contact to the environment. What they fail to include is the quality of individual perceptual facility to absorb such experiences and the motivation, which would encourage a child to seek such contact in the first place. Delyse Springett53 sums this up: *The goals of environmental education go a long way further than awareness-raising: they certainly include the need for knowledge about the environment, and for positive experience in the environment, but the important goal we must focus on now is education for the environment, empowering people to participate effectively in bringing about the changes we all need to make.*

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52 Cooper, Geoff. Head of Wigan's Low Bank Ground Education Centre, Coniston, Cumbria. In Environmental Education Spring 1992 Pages 5-7

53 Springett, Delyse. Executive Director at the New Zealand Natural Heritage Foundation, Massey University. In Environmental Education. Spring 1993. Pages 23-25

Identified Gaps in the Study of Child Perception and Learning.

As Wendy Titman54 acknowledged in the study conducted jointly for Learning Through Landscapes and the World Wildlife Fund, much of the literature available for study in the fields of, *psychology, anthropology, philosophy, geography, architecture, planning, leisure and, of course education* concerned children but, *relatively little material could be found which actually involved children.* Those researchers whose work could be most identified with an active approach to child participation were Chawla55and Hart.

This research aims to probe further into the preferences children exhibited towards the environment, to examine what it is which motivates their choices of experience. Integrating knowledge of learning processes into knowledge of the structure and composition of the physical environment could help to fill the gap left by disciplines of psychology, education and planning when examining the nature of the child's relationship to the environment. The ensuing research is intended to expand the existing knowledge in the field of environmental consciousness.

This chapter explored the concept of learning from Piaget's three stages, operative, figurative and connotative. The action of learning was explored using examples from schools, which practice *active learning.* Environmental education was taken as the application of learning within the context of encouraging an ecological consciousness within children and general theories were explored briefly.

The next step is to investigate the processes involved when a child practices *active learning.*

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54 Titman, Wendy. Special Places, Special People. The hidden curriculum of school grounds. WWF UK / Learning Through Landscapes. 1994

55 Chawla, Louise. The Ecology of Environmental Memory. In CEQ Vol.3 No.4 1986 Children's Environments Research Group.

The Self–directed Learner – developing cognitive structures

Maturana and Varela's Cytological Model of Structural Coupling

Maturana and Varela56 developed a theory of cognitive learning based on a structural comparison of the organisation and functioning of the cell with the human cognitive process. Their structuralists' argument analyses the function of the cell as a living being, with regard to the interaction between that living being and the surrounding environment. *Coupling* taking place between the outer and inner environment is constantly modified and determined by the internal structure (defined by a system of membranes). The interaction between the external environment and internal organisation is in a constant dynamic state. The content and qualities abounding in the external environment and the internal organisation latent within the cell determine this. *This ongoing structural change occurs in the unity from moment to moment, either as a change triggered by interactions coming from the environment in which it exists or as a result of its internal dynamics. As regards its continuous interactions with the environment, the cell unity classifies them and sees them in accordance with its structure at every instant. That structure in turn, continuously changes because of its internal dynamics. The overall result is that the ontogenetic transformation of a unity (*the living being, in this case, the cell*) ceases only with its disintegration.57*

What they describe is a two-way relationship of action-reaction between the defined autonomous organism, and the external environment. Both have the power to constantly alter or influence the other, depending on the duration, frequency or intensity of the interaction. *Every ontogeny occurs within an environment; we, as observers, can describe both as having a particular structure.... In describing autopoetic unity58 as having a particular structure, it will become clear to us that the interactions (as long as they are*

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56 Maturana, H.R. and Varela, F.J., The Tree of Knowledge. The biological Roots of Human Understanding. (Revised Edition) 1992 Shambhala Publications Inc. ISBN 0-87773 642-1

57 From the above, Page 74. See also pages 42 – 46.

recurrent) between unity and environment will consists of reciprocal perturbations. In these interactions, the structure of the environment only triggers *structural changes in the autopoetic unities (it does not specify or direct them), and vice versa for the environment. The result will be a history of mutual congruent structural changes as long as the autopoetic unity and its containing environment do not disintegrate: there will be* ***structural coupling.***[59]

The human is a structured composition of many of these cells, operating together to form the entity we name man, with their sub-conscious, conscious and super-conscious dimensions. Maturana and Varela expanded this analogy to describe the situation occurring when the individual is exposed to an environment and through a complex process of interaction, learning takes place. The author created the diagrams below to illustrate this principle:

58 For further reference, see Maturana and Varela 1992, Pages 47-52

59 Maturana and Varela 1992 Page 75

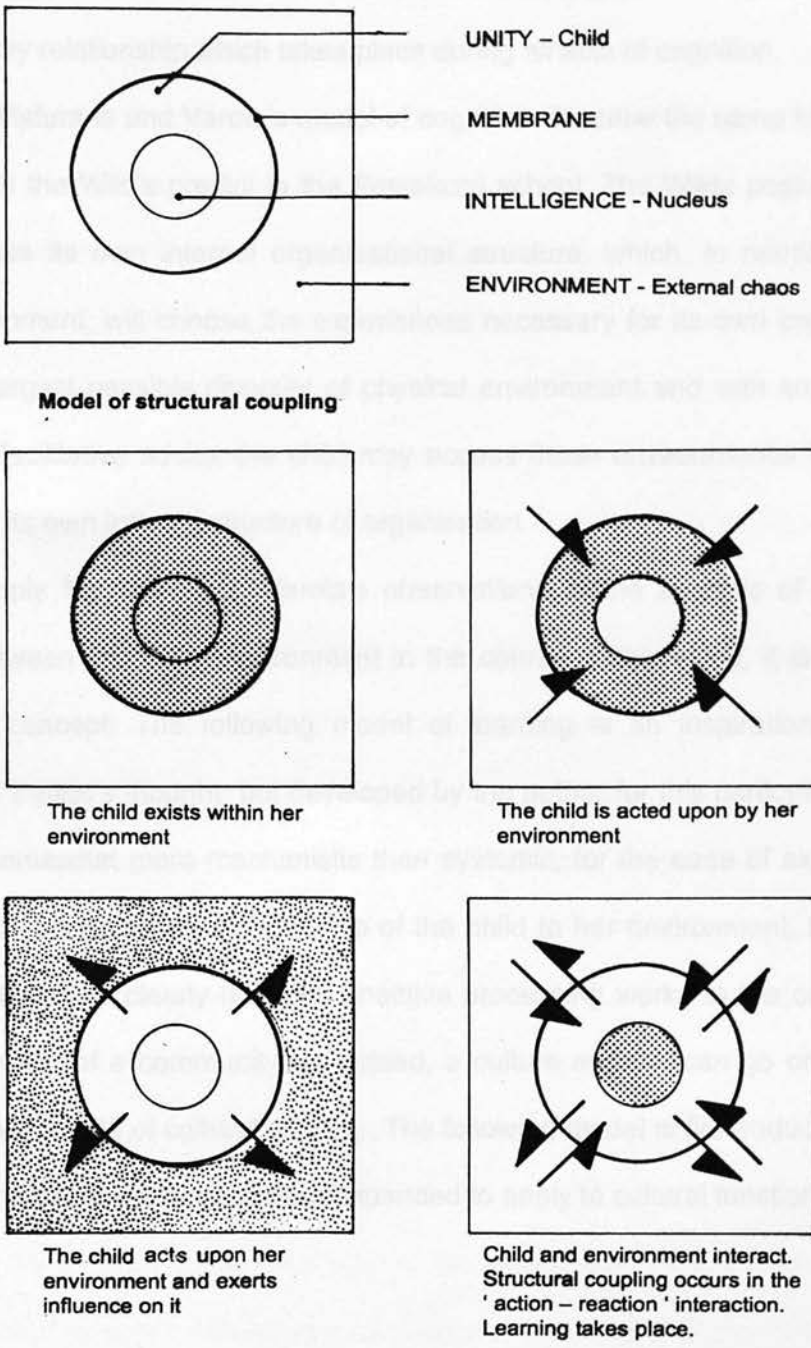

FIGURE 3 MODEL OF STRUCTURAL COUPLING

Utilising their knowledge of the human nervous system, biological functions, and observation of human and animal organisation and interaction with the environment, Maturana and Varela were able to show how the cognitive systems develop within the human. Chapters on cognitive development, cultural phenomena, language use and

development and ethics explore in their book, this coupling of internal/external structure and the two way relationship which takes place during all acts of cognition.

Interestingly, Maturana and Varela's model of cognition describe the same kind of learning process, which the Wild's predict in the Pestalozzi school. The Wilds postulated that the child possesses its own internal organisational structure, which, in relation to a richly diverse environment, will choose the experiences necessary for its own organisation. By creating the largest possible diversity of physical environment and with supportive, non-directive but, facilitative adults, the child may access those environmental *triggers* which correspond to its own internal structure of organisation.

In order to apply Maturana and Varela's observations to the analysis of the observed interaction between child and environment in the course of this study, it is necessary to simplify their concept. The following model of learning is an inspirational product of Maturana and Varela's thought, but developed by the author for this particular application. Its nature is somewhat more mechanistic than systemic, for the ease of explanation and provides a tool to explore the relationship of the child to her environment. Maturana and Varela illustrated most clearly how this enactive processing works in the coupling sense between members of a community, or indeed, a culture and we can go on to apply the theory to the wider field of cultural ecology. The following model is first reduced in scale to concentrate on the individuals and then expanded to apply to cultural functions.

The Cytological Analogy

The author first directs the research into the realms of biological cytology in order to develop this analogy for the process of learning.

The three major elements to consider are the cell nucleus (the genotype), the cell membrane (selective plasma membrane) and the environment in which the cell is submersed, (the outer chaos). The nucleus is equipped with DNA, genetic material that, apart from exceptional circumstances, which could lead to mutation remains a constant arbitrating mechanism of control. One of the tasks of the nucleus is to dictate those substances to be transported across the cell membrane as a means to ensure cell homeostasis. The cell membrane is constituted according to the structure of the nucleic DNA, and its job is to service the wishes of the intelligent nucleus. Within the structure of the membrane, carrying mechanisms were developed. These enable the transport of those chemical compounds, which serve the purposes of the nucleus, and act as barriers to those constituents, which could harm the cell. These mechanisms we can label as enzymes. Thus the cell membrane forms the interface between the 'soup' of matter without the cell and the intelligent nucleus within the cell.

In extending this analogy to the human individual, the author traces a similarity in process: The intelligent nucleus is defined as the cognitive structures. This can be called the mind, the consciousness; the directive agency within the individual, intelligence or genotype. This intelligence directs the absorption process of knowledge.

The intelligence expresses needs relating to the kind of experience it requires for its development – a development dictated by the internal make-up of the intelligence. The author labels this the genotype. The task of the membrane, in this case, the sensory faculties for enabling perception, is to select experiences from the external chaos of the environment in which the individual is operating. As Clarke[60] so eloquently expressed it; *In a sense we do not experience reality direct, but rather in a form which is filtered through the lenses of our conceptual and symbolic creations – through our mythologies, sciences, philosophies, theologies, through language itself.* Once the intelligence has expressed a

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60 J.J. Clarke. Nature in Question. An Anthology of Ideas and Arguments. Earthscan 1993 ISBN 1 85383 182 4

need, this action facilitates a perceptual exchange drawn from the environment. On completing this perceptive experience the intelligence is satisfied, until the next need expresses itself.

Exploring the motivation for experience

In a cell, the chemical messages transferring the wishes of the nucleus to the cell membrane, are the mRNA. The equivalent in the human analogy is the expression of a wish, a motivation, and a desire to acquire knowledge (experience) from the external environment. These motivations are a declaration of the individual's need to assume a state of homeostasis.

At this point, the author returns to the cell to examine the motivation for this exchange from the external 'chaos'. From conception, the cell must fulfil two functions: to grow to full development to enable maximum efficiency of function, and, during this growth, to maintain internal stability. Claude Bernard concluded this to be the principle; *the constancy of the internal environment is the condition of the free life.*[61] This led to the development of the principle of homeostasis (homoio = same and stasis = standing) which he coined in 1932. *It is used to describe all mechanisms by which a constant environment is maintained*[62] (The author suggests an expansion of the limits of this concept, to apply it to the global frame, and label it sustainability.[63])

Homeostatic Control Mechanisms

In order for homeostasis to function, the cell relies on a series of systemic control mechanisms – or cybernetics. The major constituents of these mechanisms are:

Reference point: *the set level at which the system operates*

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61 Claude Bernard, 1800's Biologist Quoted in Chapter 36 on Homeostasis. Understanding Biology for Advanced Level. 1987 Glen Toole, Susan Toole. Century Hutchinson Ltd.

62 See page 486 – 487 of the above.

63 James Lovelock wrote about this homeostasis achieved through complex feedback loops in his Gaia Hypotheses.

Detector: *signals the extent of any deviation from the reference point*

Controller: *co-ordinates the information from various detectors and sends out instructions which will correct the deviation.*

Effector: *brings about the necessary change needed to return the system to the reference point.*

Feedback loop: *informs the detector of any change in the system as a result of action by the effector*[64]

The author refers back to these components in the following discussion. Having declared the cells' two aims in life, development and achieving homeostasis, it would be difficult to ignore the tension necessarily arising from these two conflicting movements. Homeostasis is therefore one motivation of the cell, and developmental growth, to full operating potential another.

What occurs when this model is overlaid upon the developmental learning process of the child? Would it be possible to identify what it is which motivates the child to learn, and what is the manner of the interaction between that child and his environment?

Perception-Assimilation-Motivation Model of Non-directive

Experiential Learning: Enlarging on Maturana and Varela's Model of Structural Coupling.

This theory will first be explained broadly, to locate it within the framework of the existing discourse. The final section will illustrate how this model can be applied to the wider field of cultural development.

Elements of the Model for Learning

a) Internal structure of the individual (geno+phenotype)

b) External 'chaos' of the environment

c) Experience available within the prepared environment

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64 Toole and Toole Pages 486-487

d) Perceptual transmitters (triggers)

e) Perceptual receptors (cognitive structures)

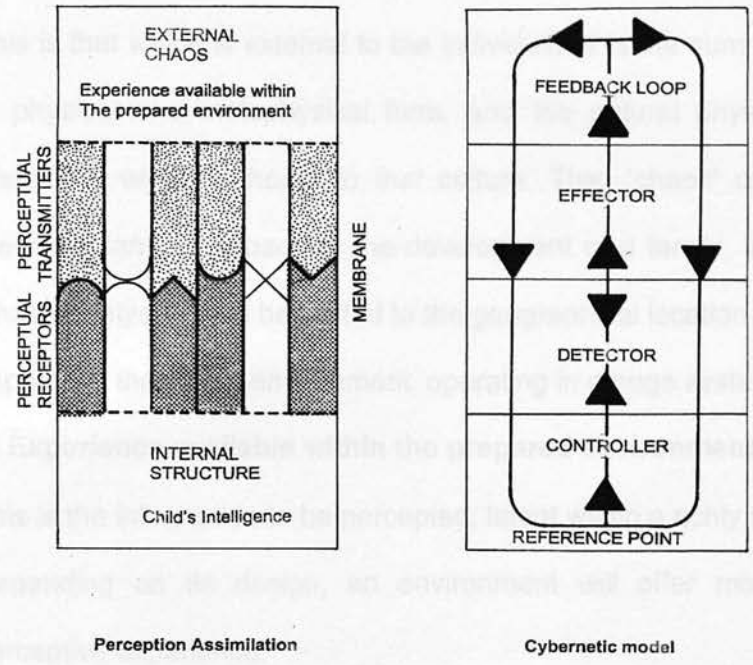

FIGURE 4 COMPARISON OF PERCEPTION-ASSIMILATION-MOTIVATION NON-DIRECTIVE EXPERIENTIAL LEARNING MODEL WITH THE CYBERNETIC MODEL [65]

Maturana and Varela's structural coupling model provides the foundation for the following diagrammatic schema. It was decided to portray one section of the environment/individual interaction for the purpose of clear presentation. Figures and illustrate the principle of the relation of the parts:

a) Internal structure of the individual (genotype)

This intelligent internal structure is exclusive to each individual. The author refers to it as the genotype, in the assumption that this exclusivity is primarily genetically determined. The biological theme should however only be taken as an analogy. Naming this the

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65 Cybernetic model according to Toole and Toole 1987

genotype should not prove exclusive to other influencing factors; such as are usually defined as, *nurture*[66]

b) External 'chaos' of the environment

This is that which is external to the individual. It is the sum of the culture, its expressions in physical and metaphysical form, and the natural physical environment, which has generated or given home to that culture. This, 'chaos' can be given many scales of measurement: its impact on the development of a family, investigating mores, or rituals. Chaos analysis could be limited to the geographical location of a playground, or include all aspects of the global environment, operating in a huge system of interdependence.

c) Experience available within the prepared environment

This is the information to be percepted, latent within a richly structured environment. Depending on its design, an environment will offer more or less opportunities for perceptive experience.

d) Perceptual transmitters

These are the elements within an environment which 'speak' particularly to the internal structure of the child. They may be action orientated, such as 'swinging', 'sliding', 'balancing', or they may be elements, such as trees, flowers, animals, bushes. They can also be human interrelations arising out of a direct response to the physical environment, such as playing games of chase (the free space available facilitates this action), playing house in a willow tepee, talking with a friend by means of a buried walkie-talkie etc. Any element in the environment may elicit several responses it depends on the structure of the individual child's 'nucleus' upon which of these latent stimuli (triggers), he will respond to.

e) Perceptual receptors

These are the internal structures existing within the individual, dictated by the 'nucleus' which determine what is percepted at the membrane interface. Just as the cell nucleus

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66 See for reference the discussion by Jones on page 226 of this debate between environmental determinists, and genetic influence. The Language of Genes. Flamingo 1993

forms the structure of the membrane, allowing or preventing the absorption of chemical 'information', so too does the individual undergo an interaction with her environment, which relates to her choice of experience and interaction with this environment.

The Process of Perception/Assimilation

Here the author returns to the cybernetic model of the functioning of the cell generated from the principle of homeostasis.

The principle of homeostasis has already been identified in terms of development. Looking at this in terms of learning, an important motivator in the child's act of perception can be identified. The child is born into the world with her own genotype, and is nurtured in an environment with its own set of constants. The child grows networks of neurones form and a perceptual library is gradually developed within the individual, which are known as constructs. Her individual genotype and phenotypic[67] criteria render her susceptible to certain characteristics of her environment. In the balance to retain homeostasis, she will need to respond to each acquired precept, any internal growth resulting from the formation of this precept, and, any changes in the make-up of her external environment. This could be labelled the *internal web of action and reaction.*[68]This view is also held by Robert Le Vine who postulated the three process types which are responsible for learning: *(a) those intervening between an immediate situational environment and an evoked response, as in emotional arousal or cognitive problem-solving; (b) those intervening between the environmental conditions experienced by the individual early in his life and his behavior at a later stage, as in memory, learning, and the developmental processes of ontogeny; (c) those intervening between the environmental conditions of the breeding population or the human species as a whole, long before the individual was born into it,*

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67 Phenotype- the modification of the Genotype in response to environmental conditions.

68 Quotation from Seminar given by Dr. Faozi Ujam. November 1999. Heriot Watt University/Edinburgh College of Art.

and his own innate endowment for behavioral functioning, as in the phylogenetic process of natural selection.[69] This stance is not foreign from Varela and Maturana's organisational structural coupling although more linear. Le Vine labels the elements of this coupling procedure: the present status of the individual, the past experience (which encompasses and forms the internal organisation) and the external environmental conditions which in turn were acted upon by previous interactions of human and environment or, the cultural ecology.

Applying the Cybernetic System to the Perception Model- Examining Motivation

The 'reference point' is the name given to the human starting genotype – at birth when neurological processes start to interact. The environment about this reference point is however constantly in flux; the reference point is therefore the name given to the individual when it is experiencing the state of homeostasis. This 'genotype' or intelligence consists of what the author has determined genetic instruction, or D.N.A. codes and the aesthetic/spiritual dimension of the individual.

The 'detector' refers to the cognitive structures developing within the brain. This detector function of the internal 'nucleus' and the cell membrane monitors the development of the individual and alerts the person to any deviation from the sustainable state of homeostasis. It is a function of the sum of the cognitive structures, a systemic exchange within the brain.[70]

The 'controller' (intelligence) bundles this information and alerts the individual as to what is necessary to correct the balance. This could be seen as the intuitive urge witnessed in children which leads them to make a decision – shall I go to the run-down here seeking adventure, or shall I go to the playground in the park, where I know I will find security, and

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69 Robert Le Vine, Culture and Personality. 1982 Aldine Publishing Company. ISBN 0202 01167 2 Page 5

70 See Pearce, and references to perception in Chapter two.

be able to meet my friends? Should I climb a tree now, or slide on my belly down the slide etc.

The 'effector' is the very action of the child – that which Piaget calls the action part of perception. It is the active choice (such as touching the stinging nettle with my hand, or pushing myself on the swing, or patting a sand cake together or shouting at the teacher...) which is integral to the process of perception. Dewey and Bentley described learning as such a systemic process; *The activity of systems involves a process known as transaction – the simultaneous and mutually independent interaction between multiple components.*[71]The 'feedback loop' gives the individual information on her new point of reference. It is this which, on comparing the perceived experience, will determine whether the experience is to be repeated, be repeated only at a later date, or not to be repeated at all.

An Example of Non-Directive Experiential Learning

In response to the detected state within the internal structure of the child, he chooses to expose himself to a certain stimulus within the environment. A boy wishes to experience the sensual stimulus (Gibson's *affordance*s, or Varela and Maturana's, *triggers*) of cold wet sand running through his fingers. At home he is never allowed to get dirty, and all his toys are structured materials in the form of plastic 'Lego', intellectually stimulating board games, computer games, or other material which can only be used in the structured, formal manner which Piaget assigned to figurative and connotative learning. In other words, the boy is exposed to similar experiences to most of his peers. What he now seeks is an experience of an unstructured, unpredictable manner; subconsciously he wishes to repair his deficit of operative learning, in order to progress to the figurative stage of understanding with a firm foundation. He cannot fully predict the way in which the sand will fall through his fingers. Even if he has done this a thousand times, the variables will

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71 Dewey and Bentley. 1949 Page 292. Quotation from Capra, Fritjof, The Turning Point Flamingo Press In his discussions on the dynamics of natural systems. Page 292.

probably be too great for him to assess without actually having the sand in his hands. What variables? The viscosity of the wet sand, the size of grain of the sand, its temperature on his hand, the colour, the smell, the sparkle in the sun etc. etc. Once he *has* done this a thousand times he will of course be more qualified to assess the condition of the sand by just looking at it. By then his feedback mechanisms will have alerted him to the fact that other experiences where he has less knowledge are awaiting his attention.

Today he wishes to concentrate his attention on the manner in which the sand slips out through his fingers and falls to the ground. This activity has fascinated him, because of its very unpredictability. The patterns on the ground can be interpreted according to the fantasy of the moment. This boy has responded to this one aspect of the wet sand – the property of viscosity, its texture and the natural slump it has taken as a result of gravitational attraction and the surface structure of the ground onto which it falls. Other aspects of the stimulus are unimportant to him.

This is illustrated graphically in the following diagram:

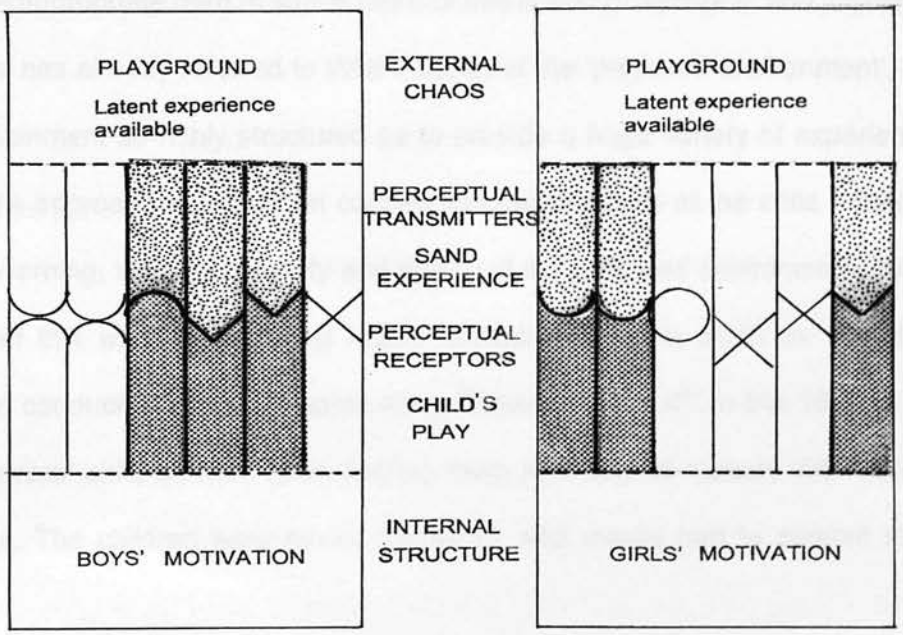

FIGURE 6 AN EXAMPLE OF NON-DIRECTIVE EXPERIENTIAL LEARNING

FIGURE 6 AN EXAMPLE OF NON-DIRECTIVE EXPERIENTIAL LEARNING

The variously shaped 'receptors' on the surface of the allegorical 'boy' and those of the transmitters which represent the wet sand experience illustrate this selective 'fit' which operates in perception. Another child may have engaged herself in the same activity, but for another set of motivations, therefore responding to another set of transmitters (Figure h). (For instance, she may have chosen to play with sand, because her friend is playing, in other words, this was an emotional attachment which acted as motivator, the active experience is less the act of feeling the sand, far more, the act of sharing a moment with her friend.)

This simple process marks the end of one act of perception taken in isolation. The boy sought to understand the properties of wet sand, acted on it, and, depending on his degree of arousal through the process will choose to repeat his experience. According to Maria Montessori, this could be up to twenty times in a row[72], before the experience has satisfied his thirst.

It would be appropriate here to speak more of this notion of 'receptor' and 'transmitter'. The author has already referred to Wild's notion of the 'prepared environment', consisting of an environment so richly structured as to provide a huge variety of experience for the child. Wild's approach to education couples the development of the child – their rate and quality of learning, with the diversity and quality of the prepared environment. We can see evidence of this when considering highly unusual examples, such as the story of an experiment conducted by the Prussian King, Kaiser Wilhelm II[73] in the 1800's. Wilhelm II isolated several children from birth, rearing them in a special nursery with no contact to the outside. The children were never spoken to, and mostly had to content themselves

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72 Maria Montessori illustrates this phenomena with examples of children using her specially constructed ‚didactic learning material. The material is so construed as to service one particular act of perception. Her theory being, that this aids the child in gaining a clearer vision of the structure of his world. For further discussion, see, Children are Different. Montessori 1971

73 See for example, Deutsche Kinder. Siebzehn Biographischen Porträts. Pages 14-21. Rowohlt. September 1997. ISBN 387 134 3269

with existence in a sterile room, punctuated by meals and regular hygiene 'checks'. Most of these children died, or were seriously ill before the age of five.

The diversity and quality of the physical and metaphysical environment; (the human environment) played an important role in the development of these children. The author hypothesises that basic physical needs are at least as important as the qualities of respect, love and social acceptance, which can be sometimes more or less abundant than suitable nutrition. This hypothesis differs from that put forward by the environmental determinists; it allows for a response by the individual in relation to this environment: some of the children died in Kaiser Wilhelm's sterile nursery, but some could transform their experience to ensure their survival into their fifth year of life.

Maturana and Varela also comment on this affordance of the environment, *Only when our structural coupling goes awry in some dimension of our existence do we realise the extent to which our behavioural coordinations in the manipulation of our world and communication are inseparable from our experience.....Without an appropriate history of interactions it is impossible to enter into this human domain.*[74]The author looks at this prepared environment, examining the interactive process between child and environment more closely. What is it, which occurs at the moment of transformation- the perceptive act, between receptor and transmitter?

The Quality of the Environment as Transmitter of Experience

The author returns to the cybernetic element of 'positive feedback' which occurs at the end of a perceptive experience. If the 'fit' between transmitter and receptor was good, if the individual was fulfilled by the experience then the feedback mechanisms will register this as positive, giving this experience a positive connotation in the cognitive structure. If, the experience disappointed because it did not behave as expected, a negative

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74 Maturana and Varela 1992 Pages 233- 234

connotation will form. The stronger the negative is experienced, the more likely it is that this experience will not be repeated.

Here we can refer to the child who touches a stinging nettle. Touching it has resulted in her becoming stung. The pain is registered as a negative experience. It is more likely that severe pain will deter the child from ever touching a nettle again. Slight pain, caused by brushing past the nettle, with limited contact, will cause the experience to be registered, but not necessarily lead to the formation of a cognition which will be a strong enough deterrent to prevent the child from touching another nettle. This is non-directive experiential learning.

Candace Pert[75]describes the interaction between cells of the body as involving the mental and emotional state of the individual. *The process by which cell receptors open up to receive various neuro transmitters, steroids hormones, drugs etc used to be described as a key turning in a lock....*but,*...receptors, molecules and ligands communicate with each other by a mutual process of dancing, humming, wriggling and vibrating. They are 'talking' to each other.* Her linkage between intracellular communication would confirm Maturana and Varela's coupling and aid the understanding of a child's preference for one environment over another. If the communicative facility between the cells of the body, which involves the use of energy, is put under stress with new adjustments made in the mental coupling and enaction within the environment, the child will become tired. It is reasonable to suppose that through this coupling facility the child will assess the degree to which he wishes to challenge himself.

The environment in which the child finds herself can be diverse, containing potential positive and negative experiences. The author argues that that environment which has been 'prepared' for the child will provide more positive experiences. The opposite can also

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75 Pert, Candace. Molecules of Emotion. 1998 Simon Shu Publishers. Pert is Research professor in the Department of Physiology and Biophysics at Georgetown University Medical Centre in Washington D.C..

hold true, and we could label this for ease of categorisation: The Hostile Environment. Erikson, a psychoanalyst and educator termed these, *facilitating and forbidding environments, and showed how the balance between the two may affect one's response to the various turning points in one's life, strengthening or inhibiting the full realization of one's potential.*[76] Maturana and Varela would dispute the environmental deterministic strain which Erikson pursued and it is well to add here that whatever interactions are incurred within the environment they are equally determined by the internal structure of that person interacting. *As observers, We are used to focusing our attention on what is more apparent to us, that is, external perturbations, and we readily believe that this is the determining factor. These external perturbations, however, as we just said, can only modulate the constant coming and going of internal balances of sensorimotor correlations.*[77]

The diagram below attempts to explain graphically the author's principles of differences between a *forbidding* environment and a *facilitating* environment. The one results in negative feedback and avoidance of the experience in the future, the other produces positive feedback and growth:

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76 Quotation taken from a lecture on the Psychology of Space given by Kent Schuette at Purdue University 1992 derived from the work of Erik H. Erikson , given to urban designers and landscape architects.

77 Maturana and Varela 1992 Page 161

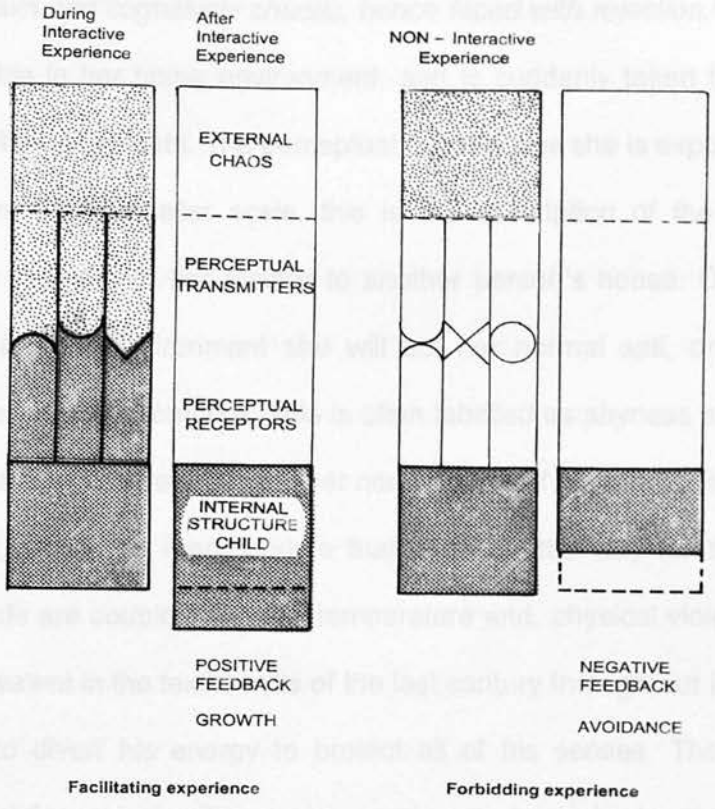

FIGURE 7 FACILITATING AND FORBIDDING EXPERIENCE

The Hostile Environment: three types

Presuming that an environment, which affords positive, healing and growing experiences, is one, which is conceived according to the needs of the child, there is an assumption to be made that a hostile environment is one where the needs of the child are ignored. There are three ways in which these needs can be 'ignored':

A) An environment can be equipped with the inappropriate 'transmitters' where there is no accessible relation between the 'receptors' possessed by the child.

This is illustrated: *The expression refers to the condition where people lack a feeling of intimacy with the places they live in because the physical and symbolic attributes of these*

places are unknown and cognitively chaotic, hence faced with rejection.[78] For example, a child is comfortable in her home environment, and is suddenly taken for two weeks on holiday to India with her parents. The perceptual experiences she is exposed to are for the most part foreign. On a smaller scale, this is the description of the reaction a child undergoes when invited with her mother to another person's house. Depending on her familiarity with her new environment she will act her normal self, or exhibit signs of 'adjustment' to her new environment. This is often labelled as shyness and is exhibited in behavioural patterns, which deviate from her normal state of homeostasis.

The environment can be so inappropriate that there is little way for the child to hide. Where loud sounds are coupled with low temperature and, physical violence for example (such as was prevalent in the textile mills of the last century through out Europe), the child has little ability to divert his energy to protect all of his senses. The child has been forcefully removed from his familiar environment and plunged into another 'chaos'. He does not possess the structures, which allow him to decipher semiotics, which are fully foreign to his lived experience.

In this case, the environmental effects are so severe as to effect diffusion into the *cell,* the internal environment. The external environment penetrates to the child, who suffers the consequences.[79] Before beginning with the analysis of situations observed during the research, it is necessary to outline two other types of hostile environment:

b) An environment can be hostile through impoverishment: it does not possess sufficient diversity of experience to fulfil the needs of the child. An appropriate reference is to the experiment of Kaiser Wilhelm II. The environment was so impoverished materially, mentally and spiritually that most of the children died. This will be explored more in the following section which attempts to explain what it is which makes an environment rich, with the potential to cater to the child's needs. The issue of boredom,

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78 Ujam, Dr, Faozi. Ecology, Culture and Cognition: A TextBook on the Principles of Environmental Design. Ph.D. Thesis Edinburgh College of Art/Heriot Watt University. 1987

79 (In this case the ill health, low stature, and high mortality rates associated with child workers of the nineteenth century.)

generated by poorly designed play environments became a key issue among the children surveyed for the Titman, Special Places, Special People research[80] *Both children and adults recognised that boredom was often the cause of all kinds of inappropriate behaviour.*

The third type of environmental hostility could be labelled **'trick transmitters'.**

c) **These are potential experiences 'offered' by the environment which appear to correspond to the needs of the child, but, in actual fact, the coded message they are transmitting are saying the opposite.** A good example of this can be seen in many parks and playgrounds available for children's use: A playground is surrounded by trees, all of which invite the child to fulfil his instinctive need to test out strength, agility, and balance by climbing them. When the 'hostile environment' enters in the form of an adult (park warden, anxious parent, and stranger) and bellows at him to get out of the tree (because of causing damage to the tree or to himself), the child has two options. One is to defend his position and remain in the tree (and this he will usually do only if he has been able to assert himself sufficiently in other less 'hostile' environments, such as the family, or his social sphere). The other option is to descend from his eyrie and acquiesce to the hostility, losing his chosen experience. Depending on the frequency of such disturbances to the child's natural fulfilling of his needs, he will become less able to articulate these needs. Such events cause a disturbance to the perceptive process which is painful – the individual has been prevented from 'living out' his experience, and the need is therefore either partially or fully unsatisfied – he has been interrupted in his attempt to achieve homeostasis. In a series of examples, Jesper Juul[81] takes pains to point out the naturally co-operative nature of the child, and the consequences when she chooses co-operation rather than self-fulfilment. The sense of regret or frustration can result in the organism rejecting the very environment,

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80 Titman, Wendy. 1994 Page 102

which he tried to experience. This rejection, based on pain is also the base of the disenchanted teenager's attempts to rip apart the fence in the chosen playground of the Cranach School children.

The Effect of the Hostile Environment

Referring back to Wild's explanation of Piaget's three stages of learning; differences in the intensity of effect, which processes of cultural alienation spawn can be traced. For example, if the child experiences hostility of the environment when she is still gathering experience of the operative kind, she will adjust her behaviour when relating to that environment. She is still at the stage of gathering basic experience to feed the development of her internal cognitive structures. If she is confronted with the same hostile environment but is already at the stage of connotative learning, she will use her acquired operative and figurative learning in a combined mental exertion to find some relation and similarity with this hostile environment. This will make it easier for her to understand its unknown properties, and hence feel sufficiently comfortable within the environment.82This has become a major aim of the profession of personnel development to better equip employees for positions of responsibility in management.[83]

There are several reactions, which take place within the 'cell' on encountering the hostile environment:

1. In the first example, the environment contained 'transmitters' for which the child had no appropriate 'receptors'. Her response is either to adapt that which she has in her internal structure and grasp a part of the experience on offer, to block it out entirely (by becoming ill, unduly subdued or sleepy) or to respond aggressively to the environment

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81 Juul, Jesper. Das Kompetente Kind Rowohlt 1997. ISBN 3 498 033301

82 This quality is considered the company's primary resource in the appraisals of major management and advisory firms. See for example the credo of Arthur D. Little, or Price Waterhouse – international firms.

83 This kind of mental adaptation is that quality prised so high by companies seeking flexible mature staff. Paraphrased from conversation with Ruslan Jalman, psychologist. September 1999

in the attempt to push it away (in this case, the child might become difficult, demanding constant parental attention, causing destructive damage or demanding the family returns home etc.) In each case this is a decision based on the feedback between the external 'chaos' and the internal structure. If the child had a terrifying ride in the taxicab from the airport to the hotel, she is more likely to instruct her 'membrane' to reduce the intensity and quantity of experience entering her 'cell'. In this case, she blocks off her receptor sites, with the fear generated from this perceptual experience. If however, the child likes fast car drives, she may choose to block off her receptive ability at a later date, unpleasantly surprised for example by roaming cattle suddenly blocking the street. Additionally, a child may enjoy both these experiences. He has been able to form an adaptive link between his past experience – driving with his grandfather's sports car, or visiting his aunt's dairy farm milking parlour for example. These experiences act as bridges against which to compare the new experience. Such 'bridging' requires energy however, and this child may soon become tired because of his constant readjustments in order to maintain a perceptive homeostasis. Falling asleep is an equally effective 'block' to such 'over-stimulation'.

The two other forms of hostile environment elicit similar responses. The teenagers climbing the fence at the timber playground expressed their knowledge of the mis-fit of the environment to their needs. They became aggressive and closed to communication with the adult world.

2. Constant disappointments from the environment force the individual to retreat into the 'cell' and shut off any available receptor sites. They do this through listening to very loud music, refusing to talk, or wearing black and purple[84]

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84 Reference from Brigitte, Magazine August 1996. And in conversation with Maxwell Fraval, who works therapeutically with colouring addition to lecturing in Osteopathy. *colours known for their effect of signalling the need for distancing ones-self.*

The third type of hostile environment is more complicated. Here the child has 'opened' itself to the experience, acknowledging the value to be gained from this interaction.

3. Either before, during or after, the child is prevented from engaging in the experience. His 'receptors' have to return to the nucleus empty handed. Depending on the stage at which this occurs in the reception, the child will be more or less 'wounded'. If the experience is stopped at the stage of intention, the child will possibly try to gain the experience another time. If the child is 'told-off' in mid-experience, as our boy in the tree, he will probably use the pain of his disappointment to seal off this receptor point, at least for a while.

The children of the Prussian experiment were subject to continual disappointment. It would have been interesting to have followed the fate of those few survivors in order to ascertain if they had succeeded in making up for their maintained deficit.

In a cell it is possible to re-stimulate the reaction process of carrier enzymes across the cell and membrane, although only up to a certain point, before the cell reaches the state of maturity and begins its inevitable structural decay. Enzyme activity is for example, stimulated by heat; the reactions speed up in relation to temperature increase.

This 'heat' corresponds to the 'triggering' facilities in the environment to which a child is exposed. If the triggers exist, or are added to the environment, it is possible for the child to gain access to the necessary realm of experience, which he was previously lacking. In this respect it could be suggested that it is never, 'too late' to make-up such deficits.

We may now explore the qualities of an environment structured with the needs of the child in mind:

The Prepared Environment

Nature's timetable unfolds the development of this intelligence within us at the appropriate moment in time. Just as steak and champagne do not constitute a suitable meal for a

toothless baby, so is breast milk not quite the right food for a teenager, in this way, our development requires a most specific diet. Feeding intelligence can fail, if we push too hard at it, we wait too long or we ignore it. The fact that intelligence is an 'in-built' potential, does not mean that there is a guarantee for its actualisation.....All that the small child wants, (the parents included), is that which nature intends: learning, in an appropriate environment – the vicinity of a ripe, intelligent intellect, open for the possibilities of the spirit, and tamed by the wisdom of the heart; acknowledging that man has every possibility open to him- and still being able to ask: " Is it appropriate?"[85]

It is now necessary to re-define what the author understands by the, 'prepared environment'. Pearce's criteria above, puts emphasis on the human side of this, 'appropriate environment'. Wild stresses both sides; the human presence, and the physical environment which is the result of the creation of one or more human presence, and the combination of the action in, and variety of, nature and the constructed environment.[86]

In the prepared environment, positive experiences act as food, or fuel for the homeostasis-seeking *cell*. 'Nourished' by a succession of positive experiences, the child has to act in order to retain homeostasis; her only option is to grow.

What process occurs when all of the child's receptor sites have been filled with appropriate experience, and the nucleus perceives no need for additions? Does the *cell* stagnate, or remain in homeostasis? If we consider perceptive experience as a kind of food for the intelligence, it would follow that at some point, even a well-stocked larder requires replenishing. As it is in the interest of the cell to maintain homeostasis, it seems logical that the cell replenishes its store. The rate at which the human child seeks to replenish his stock can be dependent on his genotype and on the availability of potential

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85 Translation from German version of Joseph Chilton Pearce ,'Evolution's End' titled Der Nächste Schritt der Menschheit - die neurologischen und biologischen Grundlagen für die volle Entfaltung des Menschlichen Potentials..1997 Arbor Verlag. ISBN 3 924195 18 8 Page 37-38

experience. The prepared environment is the *text,* which the children have available to them.

The Prepared Environment: the importance of socio-cultural context.

The place choices made by children are made because of triggers latently expressed in the physical and cultural structure. The values formed from experiences in these places accompany the children throughout their adult life. Lyons and Breakwell's *emotional affinity* is built up through repeated contact with a physical environment of choice, leading to the establishment of the adult's sense of, 'ecological consciousness'.[87]The socio-cultural environment influences what children will be drawn to. Their *genotype* is expressed as a *phenotype* dependent on the expectations and wishes of those people surrounding the child.

Depending on the genotype and socio-cultural spectrum of the users, the prepared environment can be fulfilling or fail to satisfy. The Kaplan's elucidate this point in their psychological studies of man's relationship to nature; *although in general there are broad areas of agreement as to what people like in the natural environment, there are at the same time significant and consistent differences*[88]. This is true. If the range of available experience is not sufficient to encompass the needs of those who use it for learning, then, the prepared environment takes on the status of the second type of 'hostile environment'. The environment is too impoverished to furnish the child with the necessary transmitters for perceptive experience

Examples of the Success or failure of the Prepared Environment

An observation of the relative success of pilot studies in this field of prepared environment may shed some light on this problem:

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86 See Wild, Rebeca Education for Being Shambhala Press 2000 for English version in print.

87 See Chapter 3 Forming the Thesis.

88 The Experience of Nature. A Psychological Perspective. Rachel and Stephen Kaplan. Cambridge University Press. 1989. Page 6

A small school set up in the South of England[89] with the intention of acting as a 'learning centre' copied the postulate of the Wild's Pestalozzi School. The two teachers were convinced that their attitude embodied the respect necessary for the child to choose her own learning experiences. The physical environment, which these teachers created, was small, cosy and seemingly appropriate. Eight local children attended the school. After one year the school folded, as a failure – what had gone wrong? Subsequent conversations with the parents attributed the lack of success to the lack of variety within the learning environment: Conceived of and furnished by two teachers, insufficient personal experience, inaccurately gauging the needs of the children, resulted in failure to provide the necessary transmitters for perception and therefore learning. The environment was flexible, but the staff was in this case not. The environment was speaking one message and the staff another, thus creating the *trick transmitters* of the third kind of *hostile environment.* The children played on this dissatisfaction, becoming destructive, in turn; the teachers tightened the limits to allowable behaviour. The available experience was narrowed once more by these limits and a downward spiral set in.

The Wild's Pestalozzi School operates however in constant adaptation. The physical and social environments are adapted by democratic decision-making structures which Hart, Satterthwaite, the UN Convention for Children's Rights and others proposed as necessary). Twice–weekly meetings of the Pesta pupils and staff, act as the feedback mechanism within the school. The whole school is the *cell.* The comments critique and wishes expressed by children and teacher-facilitators act as the enzyme exchange messages between nucleus and cell membrane. New ways of relation between staff and children, or between the children themselves, result from these discussions. The boundaries of the school provide the cell membrane, and the greater world without (the

89 Anonymous source 1999

chaos) is that resource to which the school must turn in order to fulfil the newly defined needs for experience.

Redefining Experiential Learning

We turn to Boud, Cohen and Walker, to restate a definition of what constitutes experiential learning.[90] Their propositions read:

Experience is the foundation of, and the stimulus for, learning.

Learners actively construct their experience.

Learners approach each event with a set of expectations, which attune them to some outcomes, and make them less sensitive to others.

Learning is a holistic process.

Learning is culturally and socially constructed.

Learning is influenced by the socio-emotional context in which it occurs.

These propositions support the author's biological learning analogy. Working with this clear definition of experiential learning, we can begin to examine the motivations of the cognitive *nucleus* and to illustrate how great an influence this internal structure has on the choice of learning experiences.

From the Individual to the Cultural:

Experiential Learning as the Base for Cultural Ecology

Introduction

Maturana proposed the analogy of cell functioning as a means of understanding the internal perceptual mechanisms of an individual. The author presented a brief exploration of these phenomena. The manner in which children form values when engaging in the environment in an operative manner has been touched upon. The necessity to attempt to

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90 Using Experience for Learning, Editors, David Boud, Ruth Cohen, and David Walker. The Society for Research into Higher Education and Open University Press. 1993 Reprint 1997. Pages 8-17.

define what the needs of children are: partly for the application of planning in an appropriate manner for and with children, has been stated. The relationship between these needs and the values, which are formed out of them, has also been partially explored. The model can now be expanded upon and applied to the cultural formation process, conditioned as it is by the values formed in the environmental context. This is outlined in the following section:

Steward's Cultural Core of Value Formation

Julian Steward proposed the model of the *cultural core* in which he stated that culture is defined by a series of core values. These core values arise out of an interaction between the specific physical environment, and the continuum of the historical context in which these reactions are taking place. Whatever degree of development, these can be labelled culture. Steward stressed how each value is developed from aspects and processes inherent in the natural environment. Examples taken from the Hopi of North America, from the Inuit of Alaska among others were used to show these developments. This kind of research has been labelled *cultural ecology* which *studies the interactions of societies with one another and with the natural environment in order to comprehend those processes of adaptation and transformation that operate to alter social institutions, human behaviour and environment. Ideally, the entire range of social and natural phenomena is comprehended in a single, "ecosystem", thus disposing of the artificial separation between man and nature. ....*It is *the study of those processes by which a society adapts to its environment.*[91] Steward emphasises how there is no one system of reaction to an environment, but that each environment and the resultant culture must be studied with care in order to describe the nature of the man-environmental relationship. This is not environmental determinism, but a holistic approach to a problem of interrelation, feedback

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91 Man, Space and Environment. Concepts in Human Geography. Edited by Paul Ward English and Robert Mayfield. Oxford University Press. 1972 Pages 115 - 118

and action-reaction. His research *stresses analyses of the relationships between environment and the exploitative technology, those patterns of human behaviour involved in environmental exploitation, and the relationships between these behavioural patterns and other aspects of culture.*

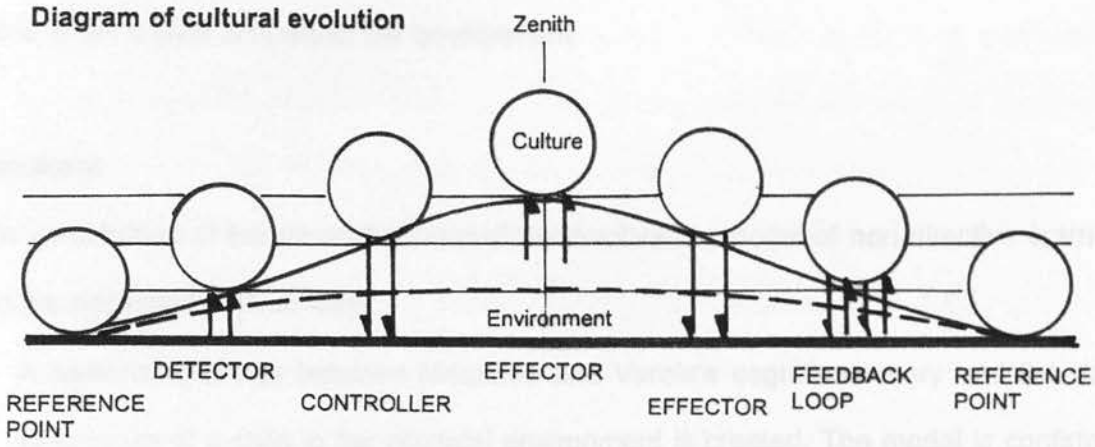
In summary, Steward suggested that cultural systems are composed of a set of values, formed through ecological interactions. The values and their interaction are what generate the physical and social expressions, which are call culture. If other interactive processes between children and their environment were to be examined, a clearer idea of their culture and therefore, their values could be defined.

Could it be that where the man/ nature interaction is limited, so is the formation of values, which are based on an association with natural systems limited? It would be wise to investigate into the major influences in this man/nature interaction. If it is the television and the media who play this role, is there a chance that this relationship is based on a virtual perception?

The authors, Vayda, Leeds and Smith, who make the link between cultural rituals and the natural feedback processes of homeostasis, hold a similar approach. They discovered that what appear to be ‚pointless' rituals in indigenous cultures, were actually performing the role of a homeostatic feedback mechanism within the culture's ecological system.

How does this theory of cultural ecology assist us in our search for a way to reconnect to the natural environment in a manner, which is sustainable for the biosphere and ourselves?

The diagram below is a visual aid created by the author to describe this process of cultural evolution:



Environment in state of homeostasis	Cultural values form through interaction with environment	Culture exerts force on environment through coupling	Culture evolves, generating physical and social expression	Cultural evolution to re-establish homeostasis	Environmental response through coupling.	Coupling induces environmental adaptation.
REFERENCE POINT	DETECTOR STAGE	CONTROLL-ER STAGE	EFFECTOR STAGE	Action by EFFECTOR	FEEDBACK LOOP	REFERENCE POINT.

FIGURE 8 CULTURAL ECOLOGY: EVOLUTION

The abstraction of the man/environment interaction into cognitive structures generates values when the experience is repeated with frequency. Maturana and Varela share this thought in the discussion of structural coupling. They define cultural behaviour as, *the transgenerational stability of behavioural patterns ontogenetically acquired in the communicative dynamics of a social environment.*[92] Behaviour is also defined as, *a description an observer makes of the changes of state in a system with respect to an environment with which that system interacts.*

The chapter on learning ends with this description of the development processes, which occur when a child acts within her environment.

Summary

The contribution of the perception/assimilation/motivation model of non-directive learning can be measured in three ways:

- A connecting bridge between Maturana and Varela's cognition theory and the daily experience of a child in her physical environment is created. The model is confirmed by the observations of the Wilds (whose own work is based on Piaget and Montessori). Dewey and Bentley's observations of the interrelated nature of learning, Le Vine's anthropological research, observations of experiential learning, the biological models of homeostatic control and Stewart's cultural ecology are theories to which this model could be applied.
- The concept of the *Prepared* and the *Hostile* environment, also discussed provides a tool to analyse, alter and plan environments in terms of the direct effect experienced by the individual. Instead of being surrounded by the vague notion of environmental determinism, or its opposite, self-determination, the *Prepared* and the *Hostile* environment provides a tool to analyse the two-way relationship of interaction and motivation (structural coupling) between the child (human) and his environment. The three types of hostile environment defined and the indicators for the prepared environment add to existing research on qualifying appropriate environmental experience. The two categories; *Prepared* and *Hostile* assist in questions concerning the nature of adaptation undergone by a child within particular environmental circumstances, and how this adaptive process can be supported. An interesting application of these principles could be in the design of hospitals. The environmental

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92 Maturana and Varela. 1992 Page 201

effect produced upon the individual during illness and recovery would be considered. Equally applicable are those environments specially tailored to learning experiences such as schools, colleges and universities. Being able to see proof of positive or negative influences of the physical and social environments on learning processes, the importance of the structuring of these environments can no longer be denied. This leads to the additional question of how this planning or restructuring should be carried out, and here it would be fully justified to return to the participation models of Hart and Sutton:

- The nature of the exchange between the individual and the environment presented in the perception/assimilation/motivation model, confirm Pierce, Pert, Stewart and Maturana and Varela's observations of human and other living unities, in the manner of communication. This communication process of interaction between individual and the environment has implications for the manner in which concepts are communicated about us and the world symbolically through the environmental texts. Titman's hidden texts must be given the attention they deserve. Here is a key towards creating a language of architectural symbolism, which conveys the ideals towards which our culture strives. If society is to more than just survive, this ideal must be one nearer to sustainable development.

Taking the model to the macrocosmic scale, issues of cultural ecology and the formation process of societal values were addressed. The model can be used to explore the notion of relevance or irrelevance of values, and to look back at the roots of the experience which generated the values.

Chapter 4

Children's Participation

Introduction

This chapter presents current successful models in the field of environmental action involving children. The projects in general aim to empower children with a sense of responsibility for their environment based on some kind of activity. In presenting these models the author hopes to reveal similarities in the approaches, and take these similarities in order to generate a methodology for the empirical research. These *best practice* models present an ideal which any project involving children would be well to adhere to. As such the models form criteria for analysis in addition to developing the methodology used.

Looking at current models, which encourage environmental responsibility and sustainable development, provides a base from which the author composed the hypothesis.

The models are explained briefly; their history and description are illustrated with examples. The model theories have often overlapping regions, which support each other. Each of the models presented is no older than fifteen years; most have been developed within the last decade. This is important as it illustrates the contemporary nature of the issue and the large factor of synchronic development within the field of sustainable development and child participation.

Looking at Children's Needs

Below is a paraphrased list of those children's needs which Katharina Martin, a pioneer in Gestalt therapy for children developed:[1]

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[1] See Page 20 Mit Kindern Wachsen Heft 4 Oktober 99 ISSN 0949-7560 (Growing with Children. Magazine)

Protection of a family,

Security of knowledge that the child's actions do not lead to their rejection,

Space to experiment and take risks,

Feeling of belonging,

Freedom from violence, the exertion of power, expectation, threat, manipulation and emotional repression.

Space to discover their own creativity, the products of which are respected without being judged or 'improved'.

Stadt+Natur provide some additional parameters based on the child's needs in the exterior environment[2]:

Children need space to play.

Children require safe access to play environments.

Children need places to meet each other.

Children need more nature in their living environment.

Children need to experience natural elements such as earth, water and fire. They must be able to climb trees discover and build – in non-predefined space.

Children need encouragement to play, but also want to play without overseeing adults.

Children need good play environments where they spend the most time.

Children need more rights. They can and want to actively participate in the fate of their environment.

Children need the adult world to be flexible and constantly adapt to the changes in development of children.

Children require a more positive attitude shown towards them from the entire society.

How do these needs transpose onto the physical environment?

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[2] Helga Berger and Norbert Schäfer, of Stadt+Natur Kinder -freundliches Rheinland Pfalz. Wasser und Natur Erleben. Ministerium für Umwelt und Forsten 1997 Page 18 (Child-friendly Rheinland Pfalz Water and Nature Experience.)

The United Nations Convention on the Rights of the Child (CRC)

In, *1989 the United Nations adopted a document with extraordinary implications for how children should be perceived and treated. The United Nations Convention on the Rights of the Child (CRC) is a set of universal standards for the protection and development of children, which, at the time of writing (1997), has been ratified by over 170 nations.*[3] The CRC has since been integrated into the constitution or legal rights of these nations. Germany for example formed the term, *ecological rights of the child,*[4] which were subsequently derived from the CRC articles. This term now influences the discussion field of children's rights when it comes to maintaining or creating an *intact environment to live in, the possibility of living a healthy life, and to develop a positive attitude to the future.*[5] Both Roger Hart and, David Satterthwaite[6] have documented those Articles of the CRC which involve the potential for development of responsibility for the environment. The eight articles are listed below:

Freedom of Expression Article 12

This article has implications for the kind of decision making processes which generally occur behind the back of the child, particularly in the field of what, and how they learn. The article suggests the expanded extent of the child's influence in bringing about change to those bodies responsible for their learning.

Article 13 and Article 14 Freedom of Thought, Conscience, and Religion

This holds implications for allowing the child to develop her or his own consciousness, without the application of external directives. It also recognises the child as a social being

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3 Hart, Roger. Children's Participation. Earthscan and UNICEF 1997 . Page 10-17.

4 This term was decided on during the German national conference of MobilSpiel e. V. Ökoprojekt, together with the Evangelischen Akademie Bad Boll in Munich 1995. The reference can be found in: Giebeler/Kreuzinger/Loewenfeld u.a. Aufstand für ein lebenswerte Zukunft. Ökologische Kinderrechte : Bestandaufnahme – Ermutigung- Wege zum Handeln. (Demonstration for a Wholesome Future. Ecological Child Rights: Assessment, Encouragement, Ways to Action.)

5 Translated extract from: Ökologische Kinderrechte – Verpflichtungen aus der UN-Kinderrechtskonvention. Diskussionspapier. (Ecological Child Rights-commitments of the UN Child Convention. Published by the National Coalition für die Umsetzung der UN-Kinderrechtskonvention in Deutschland. Page 11

6 See above, and The Environment for Children, another Earthscan and UNICEF joint publication written among others by Hart and Satterthwaite. 1996

contained within the vessel of his family, who are a major force in the type of constructs formed by a child.

Freedom of Assembly Article 15

This holds implications for activities children may undertake within their community. It implies a removal of class barriers to the child's freedom of association and the possibility of encouraging personal and cultural exchange between parties.

Access to Information Article 17

This freedom of access to knowledge, acts as an empowering tool along the path to responsible action. It also implies that children have a right to as broad an experience base as is possible, that no limits should be set to their demands for knowledge, and that these needs be recognised as valid demands.

Special Support for Disabled Children Article 23

This gives equal status to disabled and non-disabled children. There is no reason to assume that disabled children are not equally able to assume a sense of responsibility for their environment and to take an active role in its care.

Education for Personal Fulfilment and Responsible Citizenship Article 29

These are the ideals, which propel the search for learning processes, which can fulfil the concept of creating a climate of personal and collective environmental responsibility.

Article 31 Play and Participation in Cultural and Artistic Life

The right to participate in all areas of life is the strongest common current running through the charter. As the largest and most common denominator in world affairs, the United Nations was intended to act as a spokes-person for the world, as a melting pot for all the ideals and struggles of its member nations.

If the United Nations Charter is considered representative, the charter may be adopted as a steering mechanism for the question of environmental responsibility. Article 12 refers to the child's freedom of expression. This freedom is coupled with a qualitative measure of his/her ability to form a decision with maturity. It is stated that only if the child is, 'capable'

of expressing his/her opinion, that she/he may do so. Who is it who defines this capability? Juul, Wild, Liedloff, Piaget have expressed the ability of any organism to communicate regardless of age. The question to answer is not, "when are children capable of expressing a view?" but "when will we adults be prepared to acknowledge this communication, and put an end to the imposed opinions and other structures of our own cognitive instruments?"

This CRC article assumes that the child must first absorb some information from the environment in order to render him capable of decision-making. Usually, adults attempt to identify the needs of the child. This usually results in partial satisfaction. Stadt+Natur have identified those needs associated with play, Katharina Martin , with the world of emotional security and the CRC with the political will. Using children's own analysis of their needs, can add the voice of the child to this list, albeit interpreted by adults.

Martin and Berger/Schäfer mention general needs. In order to examine children's motivations research must be targeted at identifying these motivations.

The Participation Theory

To participate actively is to select a perceptual experience. Society exposes itself to the action of making choices within the environment (prepared or not), thus increasing the chances of fulfilling learning needs.

Roger Hart uses the term *environmental care* in his book, *Children's Participation.* He suggests that children develop a sense of love and care for their environment through active participation in it. He writes, *There is considerable theoretical reason for believing that concern for the environment is based on an affection for it and this can only come from autonomous or unmediated contact with it.*[7]This is realised through the process of

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7 Hart, Roger and Chawla,Louise 'The development of children's environmental concerns' in N Watts and J Wohlwill (Eds), special issue of Zeitschrift für Umweltpolitik on Environmental Psychology, (Journal for Environmental Politics and....)International Institute for Environment and Society, Berlin.

active participation. Participation can however be taken to mean many things. *The spectrum of 'participation'.... stretches from, at one extreme, simply being told what will happen (with no capacity to influence this) or even symbolic 'participation' with no substance, to, at the other extreme, having the capacity to initiate projects themselves and acquire resources and technical advice from external agencies on terms in which they have the central role.*[8] The *Ladder of Participation*[9] proposed by Hart is designed as a means to highlight the different levels of intensity and initiation by children in any project. There are increasing numbers of parents, teachers, planners and others who propound the theory of participation - but, with varying degrees of manipulation and tokenism.

The ideal situation proposed by Hart, is that of, *Child initiated, shared decisions with adults*, illustrated by various examples in the book, Children's Participation.[10]Of the eight stages illustrated on the ladder, the last five enable some degree of genuine participation. The first three rungs, *manipulation, decoration and tokenism*, have, as he argues for too long been considered viable approaches within the field of child/adult relationships. The first three could be termed the *colonial approach*[11], where definite structures of power and hierarchy are exerted in any decision-making. These *rungs*, put the child into the role of the subordinate, second-class citizen, and without the ability to exercise the rights which the UN Convention on the Rights of the child so necessarily pointed out.

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8 Satterthwaite and others, The Environment for Children. Page 202

9 Hart, Roger. Children's Participation; from Tokenism to Citizenship, Innocenti Essays No.4, March. UNICEF International Child Development Centre, Florence.

10 Hart, Roger. Children's Participation. Earthscan and UNICEF 1997 .

11 See Said, Edward. Culture and Imperialism. VINTAGE 1994 for an interesting discussion of this term .

FIGURE 9 HARTS' MODEL OF PARTICIPATION

Hart's Ladder of Participation

8 Child initiated shared decisions with adults – any project is child -designed but involves adults in key roles in order to realise the project.

7 Child-initiated and directed - mostly confined to play in a facilitating environment. Children make all the decisions about the activity.

6 Adult-initiated, shared decisions with children - an open-ended process where children are involved from planning to realisation.

5 Consulted and informed - children are invited to contribute to the process, and see all stages of the project from conception to implementation.

4 Assigned but informed - children are fully informed and feel ownership of the issues and are involved in critical reflection otherwise they follow the adult directives

----------**CHOICE**----------

The child must have the freedom of choice, determining the extent, and the area, of her or his involvement. „A programme should be designed to maximise the opportunity for any child to choose to participate at the highest level of his or her ability". This choice governs stages 4 to 8.

3 Tokenism - those projects where children seem to have a voice, but in fact have little or no choice in the subject and no time to formulate their own opinions. This is a common stage engaged in by adults who are just beginning to be aware of the need for real participation. The role of the child is little more than symbolic however.

2 Decoration - children are used to promote a cause, but have little notion of what cause it is and no involvement in its organisation. This is an adult pretence of precocious understanding among the children. This does not need to be negative if it is obvious that the children are not a part of the cause itself but their presence is used to bring joy or enrichment to the occasion, for example in the case of a theatre or dance performance.

1 Manipulation - those instances where adults consciously use children's voices to carry their own messages. An example is when children are involved in a small part of a planning process, but the finished result is so presented as if they had designed the entire project.

One of the findings in Wendy Titman's[12] research, stressed that little of the available research concerning children actually involved their active participation. This was a cause for her concern; mostly children were referred to and 'studied' but not actively involved in forming, directing or collecting the data for analysis. Her study sought to remedy this. Groups of children were questioned, invited to comment, and urged to make qualitative statements about their school environments. This was an example of participation on stages 4 and 5 of the model.

The typical restrictions of collecting empirical research data pose problems for utilising the less predictable upper levels of Hart's *Ladder of Participation*. Interesting work could be accomplished if the researcher is relegated to the post of observer, noting down a process of active participation of children engaging in their environment. Documentation of a diverse range of participatory projects can be found in Hart's book. Most of the successful schemes operate within the less industrialised nations, (such as Columbia, Sri Lanka). Fewer schemes are cited from the super-industrialised countries with the exception of the United Kingdom. His range of viable participatory schemes range from environmental clubs who foster a relationship of communication between reader and publisher, town councils for children, programs of household environmental management, turning vandals into gardeners in Curitiba, schools whose learning environment is the entire community[13], and many others.

Assuming both Hart and the UN Convention are correct, any hypothesis of participation regarding a child's relation to the natural environment, can be based on the latter five rungs of the ladder.

What these last five factors share in common is the sense of empowerment which shall be discussed in more detail in the following section on Primary Environmental Care. As

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12 Titman, Wendy. Special Places, Special People - The hidden curriculum of school grounds. 1993 WWF and Learning Through Landscapes.

13 Hart, Roger see above. Pages 129 and 62-63 The active schools of ‚New Schools' in Columbia. The entire Chapter 4 is useful.

Rapoport[14] wrote, *When people feel that they can control and influence the environment and have a visible imprint on it, they feel rather differently about it than if they cannot.* **The author surmises that the connection of care and interest with the external environment depends on the degree of participation.** Precisely this need to influence the state of the environment, generates the need for programs of participatory action.

We have identified several keynotes from the CRC, and defined the area of participation, which operates in accordance to these rights of the child. There is now the need to identify other models, which make this link between the action of the child and the development of a form of awareness for the consequences of these actions.

The author shares Roger Hart's aims. He has argued that, only through frequent *experiences with direct democratic participation in institutional settings* can *Cultural continuity* provide *a more self-conscious approach to preserving the environment for future generations.*[15] He stresses, *There is an urgent need to establish new kinds of organisations and ways of working with children that will enable them to play a central role at the local level in this revolutionary way of thinking about development.*

What is needed is some forum for activity and relationship with the environment where; *Children will have opportunities from the earliest possible age to develop an affection for the natural world through informal play and learning in biodiverse settings. From such experiences in early childhood, they will have progressively expanding opportunities to manage the environment with caring adults in their homes.*[16]

Primary Environmental Care

In 1993 UNICEF proposed an approach *of Primary Environmental Care* which, actively encouraging children and their families to work towards, *ensuring the protection and*

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14 Rapoport, A. 1977Human Aspects of Urban Form –Towards a Man-Environment Approach to Urban Form and Design

[15] Hart, Roger. Children's Participation.1997. Earthscan Page 192

[16] Hart. Roger As above. Page 193

optimal utilization of natural resources within the community[17]. UNICEF's recommendations were formed as a direct result of agreements made during the UN Conference on Environment and Development,. In this approach, UNICEF followed the recommendations made in Agenda 21. In the UNICEF sponsored book, *The Environment for Children,* Satterthwaite writes, *Primary environmental care is a term given to the process through which local groups apply their knowledge and management capacity to address their own development needs, within systems of environmental management that are ecologically sustainable*[18]. In the need to address the problems concerning appropriate aid distribution to non-industrialised countries, and concerns for the top-down approach normally applied in any form of development, the term was coined prior to the 1992 Earth Summit. The *community or collective management* was aimed to, *emphasize the knowledge and capacity of local groups to act and to promote their right to do so and to highlight how external forces were often ignoring or undermining their efforts.* The *focus is* not *on* children *but on the means by which* households, *can acquire a more stable and sustainable basis for their livelihoods and a safer living environment.*

As with Hart, most of the examples used by Satterthwaite are concentrated on the less-industrialised nations of the world. It often appears tacitly assumed that either the industrial nations of the world require no improvement, or that they have no inclination to applying such directives from the UN. Recent projects inspired by the CRC and Agenda 21's call to take action in the environment have led to a development of various planning tools to facilitate a better planned environment. *Planning for Real*[19], and the *Zukunfts Werkstatt* (workshops for the future), are two such examples which have been applied to urban regions in the UK and Germany. The application of PEC is valid any-where. The three main and interrelating elements of PEC are:

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[17] Satterthwaite 1992 Page 174

18 Satterthwaite, David (Ed) The Environment for Children. UNICEF 1996. Pages174 - 241

19 See Tony Gibson's book, The Power in Our Hands – Neighbourhood based world shaking. ISBN 1 897766 28 9, for a thorough explanation of Planning for Real.

Sustainable use and management of the environment and natural resources.

Meeting livelihoods and health needs.

Empowering local groups or communities for self-directed development.[20]Based on the case studies documented to date, Satterthwaite has discussed the approaches taken by successful PEC projects:

- *Process oriented and, as such, adaptive to changing circumstances*
- *Promoting a rapid return for poorer groups*
- *Building on local systems of knowledge and management of women and men of all ages, classes and ethnic backgrounds*
- *Strengthening the community-level institutions and social organisation*
- *Emphasising the use of locally available resources and technologies*
- *Ensuring the participation of local women and men in all stages of planning, implementation, management and monitoring; and*
- *Recognising the diversity of need and priority within each locality and the obvious fact that there are usually conflicting interests within `communities` and virtually always powerful interests outside the community opposed to PEC initiatives there.*[21]

These approaches were designed specifically for obtaining livelihoods within an aura of sustainable development. They could equally be applied to the planning and construction of a recreational area for children or to the creation of a school, which seeks to provide its pupils with the richest possible environment of the physical and cultural world. Such a learning environment of active participation in cultural and ecological affairs could provide the opportunity for action, which Piaget so stressed as necessary for the development of an individual within her society. Equally, the precepts of PEC would function well as the guiding principles for any program of research concerning the environment. It would be

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20 Satterthwaite and others. 1996 Pages 174-241

21 See above. Pages 181-183

research whose aim is not only to gather information to disseminate, but to foster a process of learning within those taking part, which itself becomes a part of the observable phenomenon.

Constructs of Environmental Responsibility

Care for the environment has been described by the German authors Kals, Montado and Schumacher, in their 1999 paper entitled, *Emotional affinity toward nature as a motivational basis to protect nature*[22]. This is the first time researchers have scientifically documented this observed affinity among children towards their physical environment. From a study using detailed survey material distributed among both random and environmentally active set of adults, data was collected concerning past (from the ages of seven to eleven) and present experiences with nature. The methodology used is described below :

Emotional Affinity.

The study was conducted by, *comparing the predictive power of emotional affinity toward nature with two constructs that have been well introduced and analysed in research on nature-protective behaviour: indignation about insufficient nature protection....., and interest in nature*. Their hypothesis statement predicts the ability to measure and observe the development of emotional affinity toward nature by looking at how it is related to experiences with nature, both past and present.

Their work was based upon previous studies, such as Lyons and Breakwell[23] who argued that children obtained intimate experience of their natural environment through observing

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22 Kals, Elisabeth, Montado, Leo and Schumacher, Daniel From, Environment and Behavior Volume 31 number 2, March 1999. Sage Publishing Inc. Article, "Emotional affinity toward nature as a motivational basis to protect nature."

23 See reference in, Kals, Schumacher and Montado.1999

animals, weather patterns and seasonal change. Maaflen[24] argued that it was experiences conducted over a longer period of consecutive time within the natural environment, which produced affection for it. Silbereisen[25] (and others) argued that the key to stimulating interest towards the natural environment, was the quality of shared experience with *significant others*. These others were peers, teachers or family members with whom a mutual cognitive stimulation and sense of curiosity about the environment could develop. The survey questioned the participants as to their, *love of nature, feelings of safety, feelings of freedom* and, *feelings of oneness with nature* and correlated this with their *present frequency of time spent with nature* and *past frequency of time spent with nature.* The results showed *the hypothesis is upheld that the provision of concrete experiences with nature is an effective strategy to promote ecologically conscious attitudes and decisions.* [26]

Their recommendations suggested that emotional affinity should become stronger the more concrete and specific the nature contacts are. The reverse is also true; where a child has not experienced specific and concrete contact, then forming a relationship will be harder. *For programs with younger pupils, it seems to be important that experiences with nature are educationally integrated* (this is the facilitative socio-cultural element). *The youngsters should be accompanied by significant others who take the role of transmitting nature values and enjoyment.*[27] Writing in 1997, Roger Hart pointed out the need for more empirical research on this important area. So far this affinity had been an assumed and observed phenomena, based on an instinctive approach to assessing a child's relationship to her environment. As mentioned above, there existed a general agreement of the link

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24 Maaflen , B.1993 a Naturerleben mit Kindern und Jugendlichen.(Discovering Natur with Children and Youths) In H.G.Hornfeldt (Ed.) Erlebnispädagogik Page 181-189 Ballmannsweiler : Schneider Verlag Hohengehren

25 Silbereisen, R.K., Eyferth, K and Rudinger, G. (Eds.) 1986 Development as action in context. Problem behaviour and normal youth development. Berlin. Springer Publishers

26 Kals, Montado and Schumacher, 1999Pages 178- 202

27 Hart, Roger. Children's Participation. Earthscan and UNICEF 1997 . Page 10-17

between experience of the environment and a positive relationship with that environment. Kals, Montado and Schumacher[28] advanced one step further in the need to explain how this relationship is formed.

Hart has offered us his ladder of participation, as a model, which acts as a guideline to the relative degrees of responsibility which children, can take on during any project of participation. In the next section, Sutton argues that it is through empowerment of the child, a form of active encouragement, which frees the child to act out its ability and willingness to change the environment for the better:

The Urban Network Program

In 1991 Sutton created the Urban Network program at the University of Michigan College of Architecture and Urban Planning. Her aim was to, *layout the parameters for an approach to helping children realise their power to responsibly influence their social universe through activities which are founded on the physical environment.*[29] The participatory program, designed by a mixture of planning professionals, teachers and other professional organisations aims to achieve the level of participation which Hart called for. Through a combination of design/creativity and hands-on activity the program aims to achieve social cohesion and to develop the, *capacity for advocacy* among children. *A primary goal is to, enable children to elaborate on their intuitive understanding of the physical environment as a map of society – one that reflects its beauty as well as its injustices – and to understand their own power to participate in its re-creation.*[30]

The way the Urban Network achieves this is to bring social activity to the forefront of any scheme of (usually urban) improvement to the physical environment. Basing her work on

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28 Kals, Montado and Schumacher, 1999Pages 178- 202

29 Sutton, Sharon.E. Weaving a Tapestry of Resistance. The Places, Power and Poetry of a Sustainable Society. Critical Studies in Education and Culture Series Edited by Henry A. Giroux and Paul Freire. Bergin and Garvey. 1996 Page xiv

30 Sutton, Sharon. From Enabling children to map out a more equitable society. In Children's Environments, Number 9 Page 37. 1992

the critical educational theorist, Kurth -Schai[31], she cites him: *such a milieu would exhibit collaborative, empowering human relationships; self-governance with participants directing and evaluating their own endeavours; intergenerational learning that encompasses a diversity of skills and division of labour; an expanding, cohesive social network; and an emphasis on celebrating one's achievements.*

The Program began in 1986, and was later recognised by the American planning Association Education Award for its contribution to children's awareness of planning issues. Sutton's, *particular interest focuses on how children's attitudes toward social and environmental equity are shaped by their experience of the physical environment.*[32] Sutton's book was written as part of the larger debate regarding the tendency to out-lore cultural diversity and to restrict the learning processes to a narrow definition of individual achievement. As Henry Giroux[33], wrote in the forward, *This volume is part of a new discourse that challenges narrow disciplinary boundaries and theoretical paradigms, illuminates how schools function as cultural sites actively engaged in the production not only of knowledge but of social identities.*

Through the conducting of interviews, making plans, proposals, publicising an event, planting flowers, sewing banners, building a toy structure for a playground, or any other form of active involvement, this sense of social cohesion is formed. Sutton's book, Weaving a Tapestry of Resistance[34] documents much of her work carried out in low and high–income schools in the USA. It is clear from her analysis that the participating children carry with them a sense of achievement and the memory of having stretched the boundaries of their environmental awareness to beyond the walls of school and home.

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31 Kurth-Schai, R. The Roles of Youth in Society: A reconceptualisation. In Educational Forum, Number 52. Volume 2. Pages113-132

32 Sutton, S. See below. Page 125

33 Giroux, Henry A., joint editor with Paulo Freire of the Critical Studies in Education and Culture Series, of which

34 Sutton, Sharon.E. Weaving a Tapestry of Resistance. The Places, Power and Poetry of a Sustainable Society. Critical Studies in Education and Culture Series Edited by Henry A. Giroux and Paul Freire. Bergin and Garvey. 1996

Sutton is quick to stress that all of her work is based on the precept of holism; she is not keen to document the internal processes within the children, preferring instead to measure the success of a project by the quality and lasting nature of its outcome. She focuses on the destructive attitudes within the society of the United States, the patriarchal power contract, is one. Her stress on the need to empower the youth (and the general populace) into taking action begins with the premise that, *being able to appropriate a space of one's own is important to gaining a sense of personal control and inner security.*[35] Sutton assumes that the overpowering patriarchal culture of `power through wealth` and its uneven distribution would lessen its ability to form fixed mental constructs, when children are, *actively engaged in socially critical place-related learning.*[36] Like Titman, Sutton holds the view that the power of *the hidden curriculum* existing as codes or texts[37] to be read throughout the environment is immense in forming the child's view of herself and her ability to affect change within her environment.

As a result of the combined analysis of ten years running the Urban Network program, Sutton developed a hypothesis of learning responsible environmental behaviour, which she dubbed the, *Tapestry of Resistance*. In her search for the kind of, *participatory instructional method,* the, *inner strength and will to start a movement to reconceive Earthly relationships* and the necessity for a, *landscape which might enable (children) to take leave of their assigned ranks and roles in the hierarchies of the dominant culture*, Sutton composed a three-dimensional web of learning.

Basing her definitions of learning on the work of Freire, Horten and Dewey, Sutton constructed a three layer progressive structure beginning with, *conventional pedagogy, transformative pedagogy* and, *alternative pedagogy*. These form the woof (or weft) of the tapestry of action. *Sustainable physical contexts, democratic governance structures, and*

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35 Sutton as above, Introduction, Page 5

36 As above. Pages 21-26

37 See Titman. Wendy. Special Places Special People Learning Through Landscapes / WWF 1996. Pages 16-17 and Sutton as above, page 4

empowering learning processes form the warp. She illustrates this model with examples from three programs of education, conventional, transformative and alternative, which have achieved her vision of *Resistance in a sustainable society*[38].Sutton's program has received praise as a model for empowering children to an increased level of environmental and social consciousness. This is done primarily in classroom studies with limited change to the physical environment.

Sutton worked in school settings with individual classes to identify those problems, which were causing concern for the children. Primarily social problems, such as poverty, lack of security, dealing with the 'latchkey' syndrome of what to do before the working parents come home, were focused on and made themes for month-long projects. Sutton identified the three layers of the warp as integral parts of the whole when considering any issue within the neighbourhood. Her successes in the social network of the community suggest that such an education strategy could be a powerful tool in the consciousness raising process for the environmental dilemmas facing communities. Sutton prioritised changes to the physical fabric below changes to the social consciousness. There is merit in identifying elements of physical change, which on combination with Sutton's classroom techniques could produce real change in the social and physical environment.

What we can read here is the construction of Sutton's thesis, which holds the elements of participation, of learning, and of taking responsibility for action. These interrelated and combined, form her vision of a model to generate action, which is sustainable in children. Her aims are similar to those identified at the beginning of this thesis. Sutton omits to describe decisive structures for *how* this can be achieved. The reader has to make a leap of faith between documented analysis and the drawn conclusions.

These omissions are useful for generating the parameters necessary to identify in the empirical research of this thesis:

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38 Sutton, Sharon. Weaving a Tapestry of Resistance. Pages 197-222

What do these, *Sustainable Physical Contexts* look like?

How are they to be constructed and managed?

What kind of governance structures can be used for genuine democratic participation?

Who is involved in this participation ?

What is the role of the child, and what, the role of the adult?

What do, *Empowering Learning Processes* look like in practice?

How are children 'taught' in this context?

What are the measures for environmentally responsible behaviour?

Variables for Constructing the Prepared Environment

*We have come to call these persisting purposes (*motivations*)"making sense" and "involvement".* Making sense *refers to the concern to comprehend, to keep one's bearings.* Involvement *refers to the concern to figure out, to learn, to be stimulated*[39]. Stephen Kaplan seeks variables, which could describe personal preference to place. His approach above, was developed for planners. He was eager to show that, *Both the contents and the organisational patterns play an important role in people's preference for natural settings.*[40] His 1989 contribution to the perception of landscape led him to develop four factors: coherence, legibility, mystery and complexity, two of *involvement* and two of *making sense.* These are related primarily to the aesthetic preference, the psychological motivation taking second place.

- Coherence deals with the child's sense of a defined place. When a place expresses coherence, the physical aspects, which command attention, are major organising factors within the environment. This assumes some form of hierarchy of objects within a scene – light and dark, curve and point, smooth and rough are not simply evenly

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[39] Quotation from Kaplan, Stephen. Chapter 4 Perception and landscape: conceptions and misconceptions. From the book, Environmental Aesthetics. Jack Nassar Pages 45-55

[40] Quotation from Rachel Kaplan and Stephen Kaplan. The Experience of Nature. A psychological Perspective. Cambridge University Press 1989 ISBN 0-521-34939-7 Page 10

distributed across the picture plane, but there is an inherent organisation of relative impact between different elements. This assumes a form of tension, which defines ‚this' as a place relative to ‚that'. This tension may arise from a central dominating feature, or from the spatial arrangement of features within the place relative to that, which is without the place. Where it is not easy to perceive the borders to a place, where elements are simply scattered and/or bear no obvious relation to another then there is little coherence. Coherence also fails when the most visually distracting elements turn out to be unrelated to the purpose and use of the place. An example of this is where decorative elements are applied to a place with no relation to the content and function of the place. In other words, the decoration is relegated to the status of aesthetic "add-ons" with no bearing to the cultural or contextual purpose served by the place.

- Kaplan's definition of legibility relates to the three-dimensional attributes of space, which afford a sense of security. Kaplan adapted Appleton's stance that a place offers, *informational opportunities and informational dangers*[41]. Legibility is concerned with the informational dangers of a place, or the perception of relative safety to be enjoyed in that environment. *A highly legible scene is one that is easy to oversee and to form a cognitive map of.*[42]
- *Mystery involves not the* presence *of new information, but its promise. Mystery embodies the attraction of the bend in the road, the view partially obscured by foliage, the temptation to follow the path "just a little further".... There is also a sense of control, a sense that the rate of exposure to novelty is at the discretion of the viewer.*[43] From this definition of Kaplan, it follows that those environments devoid of mystery, will be

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[41] Kaplan, Page 49 1981
[42] Kaplan, Page 51 1981
[43] Kaplan, Page 50 1981

visually flat, lacking spatial depth or without restrictions to the view. A place without depth or intermediate layers in the visual picture plane will be easy to predict – that is, there is no need to discover, one can take-in the entire field in a glance. When a place has mystery, there is a gradual unfolding of experience on progression through it, the place stimulates exploration. Like a treasure map however, there is some form of continuity from one experiential field to the next, so that feelings of insecurity do not arise through constant surprises. This continuity is created either by the physical structure, through some element, which links different experiences together. It can also be through subtle visual links – such as being able to glimpse through bushes to the space beyond, or through level differences which allow for views down into a space.

Many school playgrounds lack mystery. Without the sense of discovery, monotony sets in and children are thrown back on themselves. The empty environment is soon exhausted of potential. Wendy Titman illuminated this in her study of playgrounds[44] *It is interesting, not to say alarming, to note the extent to which the issue of boredom arose in our research. However, whilst children usually related boredom to the limitations imposed by the environment in terms of its design and management, adults rarely did, citing "children's inability to play" as the cause rather than the effect of both boredom and inappropriate behaviour.* Treasure hunts, hide and seek, role playing, of pirates, fairies and computer game heroes require places to hide, be partially concealed, but also to be found again.

- *Challenge* indicates the need for the child to encounter and continually test his own limits. Jones defined this: *Variety-seeking behavior may be of two types – diversive, seeking change as an alternative to familiar stimuli and epistemic- seeking new information augmenting knowledge of the world.*[45] Previously, challenge would have

[44] Titman, Wendy. 1994 Page 102
[45] Quotation from Jones, in Progress in Experimental Personality Research Editor B.A. Maher. Vol 3 New York Academic Press. 1966

been solely measured by diversity, inherent in the environment (Kaplan labelled this, complexity). Diversity can only be measured in relation to something else which renders it inappropriate for general application to other places, people and time. A better measure is created when we assume that the child's choice of an environment is inherently a projection of his own inner structure, and experiential needs. Where there is a choice of environmental conditions, at least some of these needs will be fulfilled. For example, the child who seeks out an environment where she will be confronted by younger children, requires the experience of interaction between someone smaller than herself, perhaps as a means of gaining confidence necessary to confront older children. The challenge occurs within the social milieu, or, on the physical plane within a diversely structured environment.

Kaplan's variables provide a tool for analysis of the case studies, which could lead to a greater understanding of the child's relation to the external environment.

Developing the Hypothesis

The hypothesis is developed from a consideration of the four areas examined so far: Environment, Sustainable Development, Learning and Children's Participation.

Can a method be created as a form of looking at the environment from the child's perspective? Being able to see the environment through the eyes of the child, would facilitate more effective environmental improvements for these children. **Such a method should represent an accurate map of the effect, which the social, physical and cultural semantic environment has on the value development of these children**. This should refer to their personal values and more particularly for this study, the way in which they have come to value the natural environment.

The CRC document of children's rights emphasises the role of play for children. Hart's Ladder of Participation gives clarity on the need to act with openness and integrity when involving children. PEC provides one way to strengthen the relationship of care between

the users and the resources used within the social and physical environment. The writers on Emotional Affinity claim to have identified the source of the connection of love and attachment to elements of the natural world, which in later life engender caring action. Sutton strives to empower children through appealing to their emotions as a method to implement change on the level of the social consciousness.

The texts on learning has identified the early years of childhood development as the most crucial for learning but also for the personal subjective interpretation of the elements which have made up the environment of the child. These perceptions are dependent on the emotional environment in which the child is submersed as much as they are from the physical reality. There has been shown the need for active experience within a place as a means to develop affinities and create cognitive structures. The activities engaged in by children are those directing their relationship to their environment. The more the child is free to direct herself, the more genuine will be the choice of experience and the relationship to the environment will have been one of choice and individual perception. It follows that there are many factors operating simultaneously within the environment which affect the choice, and the experience embarked upon by the child, and therefore her attachment and value formation.

- The factors listed above have generated the approach taken by the author in the construction of a methodology for research in this area.
- The author asks whether there is a way whereby emotional affinity and the building of conscious perceptions of the physical environment could be encouraged by providing children with a series of appropriate environmental experiences?
- Could select environmental experiences influence the development of a relationship of care towards the physical environment?
- And if so, what measures would we need to develop to make decisions regarding these experiences?

The author wishes to test whether a process can be developed to search for these appropriate experiences. A search where the process itself is part of the 'appropriate' experience which generates this sense of environmental care or affinity.

The knowledge required is:

- What does a child need from her environment?
- How can a suitable method be developed for researching these needs? And,
- Could this information of appropriate experiences be used as a tool for planning within the environment?

The methodology developed in the following chapter sets out to answer these questions.

Chapter 5

Methodology

In the previous chapter, the author examined approaches whose aim it is to assist the development of a culture of sustainability and environmental responsibility. A summary of these approaches is written below. They perform the function of parameter settings to aid the construction of the research methodology and in some cases, the analysis.

Defining the Parameters to Govern the Research Method

The CRC defines rights of children, which should be considered on any venture with or for children. Hart's ladder of participation supports the CRC specifying the usefulness of varying degrees of participative involvement with children. Hart's approach to participation as an empowering process of learning infuses the reader with zeal to apply his findings of the relationship between self-directed activity and the responsibility of a sustainable nature. PEC, stems from the objectives identified in the United Nations Agenda 21 document on sustainable development. Through participation, empowerment, social mobilisation and the (re)construction of the physical environment, this program aims to develop and maintain values of environmental and social responsibility.

Sutton's Urban Network project stems from a similar approach to social and environmental improvement. She uses empowerment through developing with the children an increased awareness of the factors responsible for maintaining the status quo.

It follows that the methodology whose aim is to understand the child in relationship to his environment, must employ principles of non-directive participation in order to illicit results free from the manipulation of the adult perspective. These model projects share three realms of activity where the relationships between and for the child and environment are formed. Sutton labels them, *sustainable physical contexts, democratic governance*

strategies and empowering learning processes[1]. Hart stresses the interrelated function of physical and social environments where the child participates. Primary Environmental Care consists of reforming the social structure through improvements to the physical environment within the local knowledge contexts. The process orientation of this scheme renders it suitable for work with children. Knowledge and the ability to apply that knowledge, increases over a period of time particularly, concerning skills of craftsmanship or communication. The method laid out below was an attempt to fulfil the demands of a cumulative, highly participative, contextual, and empowering methodology.

Children Prescribe the Method

Brian Little[2] stresses the necessity, *to inquire into their own particular system of constructs* if anything is to be gained from a study conducted with children.

What was needed was a child-directed study, propelled and modified by the children themselves, their needs and abilities. In order to penetrate these child constructs, it would be necessary to follow the path taken by the children.

The Learning Through Landscapes study provided a valuable springboard for configuring such a methodology. Their main research objective was to establish a link between the state of the environment, and the behaviour exhibited within it[3]. By illustrating clearly different behaviour patterns in varying qualities of environment, and through direct questioning of the children involved, the study was able to reach strong supporting conclusions of this phenomena. To achieve this, a semiotic approach was employed.

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1 Sutton, Sharon. 1996. Page 200

2Little, B. The Social Ecology of Children's Nothings. In EKISTICS Vol.47 No.281 April 1980 Athens Centre of Ekistics, Athens Technical Organisation, Greece ISSN 0013 2942

3Titman. Page 15, par. iv. See above.

Three Case Studies

Two classes of school children aged seven, eight and nine from the German town of Weimar were chosen for analysis. The Lucas Cranach School and the Walther Rathenau school children were involved in the twelve-fourteen week research process. The Lucas Cranach School is traditional, the Walther Rathenau is marketed as progressive. The children of the Lucas Cranach School lived in a fully planned, monotonous architectural desert, existing as an independent quarter of Weimar. They were not used to taking initiative in learning and had been subject to a highly directive educational process since the age of two. They were not used to participating above the level of three on Hart's *Ladder.* The children of the Rathenau School lived in a diverse urban neighbourhood and were exposed to a wider degree of environmental experience than the Lucas Cranach children in their daily lives. Their teacher (with whom they had been for two years), encouraged participation up to 7 on Hart's *Ladder* (although the social climate of the school did not always support this.) Both schools are essentially conservative although they have both undergone upheavals in the curriculum as a result of the 1989 switch from communist to democratic regime with the German re-unification. Weimar provided the opportunity of studying contrasts in educational approaches, social stratification, and the planning of the physical environment within a relatively small geographical area. A 10-minute drive or 25 minutes separated the two schools from each other on foot. These variations were deemed useful for obtaining convincing insights into the nature of the child environmental relationship. How might these two classes of school children differ in their perception of their needs, in their ability and willingness to participate and learn and in their self and environmental awareness?

The third case study is the Regenbogen Kindergarten in Hütschenhausen, Germany. This is presented later in the chapter. A very different form of analysis was chosen for this case study. The environmental and social semiotics of the kindergarten grounds was analysed rather than engaging in direct studies with children attending. By participating

with children, the planners sought to work within progressive educational structures bringing about transformative change through the action of planning, building, maintaining and playing within these environments. The Pestalozzi School described earlier is another example of such an approach. The school is not included in the analysis, rather, their approach is often referred to within the text as a comparative instrument.

The purpose for including this case study was to acquire knowledge about the kind of physical and social conditions, which can lead to the development of environmental care or consciousness in children. The research aimed to test the effect of the planned environment and its design vocabulary as a vehicle for imparting such values.

The following tables show how the case studies are structured. The top line shows the three structuring components used by Sutton in her structured analysis of children's environments. These are used as a framework to link the three case studies. The left column portrays the type of education to which the children participating were exposed. A. illustrates Sutton's model and B. illustrates the models used for the construction of the methodology for research:

TABLE A. THE RELATION OF THE THREE CASE STUDIES TO THE THESIS.

The Tapestry of Resistance (Sutton)	**Sustainable Physical Contexts**	**Democratic Governance Strategies**	**Empowering Learning Processes**
Conventional Lucas Cranach School Walther Rathenau School	Places chosen by children (see method below)	Program design and, level of participation Educational program	Active Participation Increased Awareness 3-7 Hart's Ladder
Transformative Hütschenhausen Kindergarten	Kindergarten Grounds	Participation Method in planning and children's daily activity	Active Learning(Experiential) 6 Hart's Ladder
Alternative R.Wild Pestalozzi School	Prepared Environment	Democratic Government Community Involvement	Active Learning(Experiential)

The *alternative* entry is included for comparison as the sole representative of an alternative form of educational institution to which children are exposed. The example of the Pestalozzi School has not been included in the main analysis and has been referred to in Chapter 3. The table below summarises the models, which have guided the formation of the research methodology

TABLE B. MAIN INFLUENCES GENERATING THE RESEARCH METHOD.

Case Studies: Learning Continuum	**Methodology: for the collection of Data**	**Analysis: Tapestry of Resistance** Sustainable Physical Contexts Democratic Governance Structures Empowering Learning Processes	**General Influences**
Conventional Lucas Cranach and Walther Rathenau	Semiotic approach(Titman) Urban Network (Sutton)	Picture Analysis Environmental Psychology	Participation (Hart) PEC and CRC Planning for Real (Gibson) Wild/Montessori Agenda 21 Emotional Affinity (Kals, Schumacher, Montada)
Transformative Hütschenhausen Kindergarten	Interviews, Observation, Plans, Photographs	Key of sustainable Development BUND Semiotic approach(Titman) Active Learning	Wild Participation (Hart) CRC PEC Emotional Affinity

Two Weimar Schools

The Lucas Cranach School in Weimar Nord

Introduction

Built in the 1970's and 1980's as a showcase for the realisation of soviet ideals, the estate of Weimar Nord encompassed two junior schools, a *Hort*, (where children were occupied during the afternoons), a shopping mall for daily needs and a huge quantity of almost identical living spaces. The invention of concrete pre-fabricated units by the Russians in the 1960's facilitated large-scale, high-rise building developments of this kind. Intended for

those who 'toed the party line', apartment types were reproduced *en masse,* filled with select individuals and families and promoted as the ideal living machine.

After the Wende of 1989, and the shattering of the socialist dream, the area began to suffer in popularity. No longer restrained by equality of income, the professionals began to seek alternative living environments. Those who were left remained due to family ties, economic shortcomings, age or lack of other affordable living space. Families now dominate the area with one or two children and two working parents.

The estate of Weimar Nord was viewed as too large to be neglected, and the local government began the sanitation of the estate, block by block.

Since the Wende, social issues such as increased unemployment, increased criminal activity, a decrease in the frequency of structured social activities, increased traffic, and decrease in public transportation, all left their marks on the estate. The 'positive' acquisitions of improved sanitary conditions, the relative abundance of material goods, higher disposable incomes (for those working), increased car ownership, funding for maintenance and play facilities left no lesser trace.

The area presents a fascinating study of post communist transformation to a capitalist culture.

Cranach School - Pedagogical Background

The Cranach School exists as a primary school since the early 1970's when it was built. Most of the staff was left intact after the Wende of 1989, although the school has moved away from the totalitarianism of the communist regime. The teacher of the class studied held the position of deputy-headmistress, and enjoyed considerable authority within the school. The physical structure of the class revolved about the blackboard and the rows of desks, the teacher's being placed at the top of the class, adjacent to the board, and commanding a full view.

The children were subject to a regular timetable and standard curriculum with four options. The school day ran from 8:30 to 12:00 or 13:30 with some afternoons devoted to sport.

The children were expected to sit in their places, work quietly, speak, when spoken to, raise hands for questions and fulfil the task provided; although this was not always the case. On such occasions, the teacher resorted to raising her voice, using irony, promise of reward (extra gym lessons) and comparing the 'good' to the 'bad' students. Those with *learning problems* were positioned at the front of the class and a form captain was chosen to promote leadership qualities. The children were not trained in taking initiative in choosing activities or learning material; the education they received was directed, task orientated, and conversation with an adult was primarily of the question-answer type.

The Walter Rathenau School in the Bahnhof's Viertel

Introduction

In 1840, the necessity of building the railway outside the town of Weimar provided the impetus for later expansion of the town northwards. The Bahnhof district was built between 1890 and 1920, with later additions in the 1930's and 1950's to the north of the existing town. Primarily conceived for small industry and commerce, with tenement housing above, the area was populated by those with low income - and their bosses.

During the soviet era, the area became run-down, despite several model-housing schemes of the early communist period. 1989 saw a reappraisal of the area - there were those who saw the money to be made in developing, and those, whose only wish was to move out of the smoke-choked streets and crumbling stucco. The students and low-income families moved in and those properties whose legal rights could be confirmed were subject to the process of gentrification. In 1997, every fifth house was undergoing some form of renovation; scaffolding, obstructed pavements, rubble slides and diverted traffic had become every-day. With increasing rents (in the renovated property), the population became more diverse. The flush of new cafes and restaurants struggle to survive the traffic diversions and establish the area as a viable commercial destination.

The Rathenau School is set at the gateway between Weimar Old town and the Bahnhof's Viertel, the gap between them is bridged by a park and public museums.

Walther Rathenau - Pedagogical Background

The headmistress of the Walther Rathenau School was eager to instil an atmosphere of progressive education into her school, which had to redefine itself after forty-five years of communist doctrine. This reform was carried out to varying degrees of success. Uschi Kettel, the teacher of the class involved in the research, was the only teacher in the school who was trained in the Montessori method. Her classes took elements of the Jena-Plan Reform Pedagogy[4].(Mrs Kettel was one of the first to resurrect this suppressed philosophy of education; she worked to set up a Jena-Plan School in Weimar after the Wende.) Her classes sought to bring more freedom and independence into the learning process. Her teaching style was limited by lack of space, need for conformity within the school, and lack of material resources.

Why Weimar?

Weimar is situated in the heart of what was prior to 1989, communist Germany,(DDR). A town of approximately 35,000 inhabitants, Weimar has despite its size, a complex history; Goethe, Schiller, List, the Bauhaus, the Weimar republic, Buchenwald, the Soviet inheritance and the European city of culture 1999, suggest Weimar's position as representative for the events governing the history of Germany.

Weimar presents a unique opportunity to pit various strongly differing architectural physical environments against one another, within a cultural structure, which during the

4 Jena Plan Schools. Based on the pedagogical theories of Peterson, who set up a series of reform schools at the turn of the century in Thuringia, Germany. The full development of the child provides the centrepiece for the educational process, rather than the more traditional view of education whose aim is to structure the child so that she may fit into society.

socialist regime was relatively homogenous. Even more interesting is to detect the cultural movements since the "Wende" and their manifestation in all levels of the environment.

Methodology for Practical Research

Stage 1. Getting through to the authorities

Once the aim was formulated to carry out research with second year students (aged 7-9) from Weimar elementary schools, necessary permission was obtained from the Weimar Educational authorities. The schools were chosen on account of their different physical and pedagogical locations.

Interviews with the educational authorities resulted in three conditions being set in order for approval to be granted:

i. The principal and teachers of the two chosen schools should comply.

ii. Written permission from the parents of each class of approximately twenty to thirty children must be sought.

iii. The Ministry for Culture for Thuringia had also to give its consent.

This permission achieved, the project could begin.

Stage 2. The Plan of Action

Through discussions with those teachers involved, the decision was made to meet on average once a week for a period of up to fourteen weeks for completion of the project.

All surnames were kept anonymous for the purpose of the study.

The class teacher was always present during the outdoor and classroom sessions with the children, to provide extra information and to generally maintain the relaxed working environment.

Weeks 1-4 are concerned with a preliminary definition of the children's needs. The children were to gain familiarity with environmental situations in order to increase their observation, expressional abilities and their consciousness of what they saw as important.

These four stages were based upon the author's observations of the methodology of Piaget, Titman, Sutton, Wild and Hart. As the weeks progress, the method offers more opportunity for detailed focus on the environmental needs of the children, moving from the general to the specific.

Weeks 5-13 were concerned with choosing and honing these details of place which the children defined as attractive. After the initial educative four weeks, the remaining time was devoted to narrowing and defining.

Week One The Introduction

The children were introduced to the project and the proposed content of the next twelve weeks' work with the aid of a set of illustrations to represent the various stages of the project. These had been constructed on (20 x 20 cm) boards beforehand. Information boards were used by Learning Through Landscapes: *The semiotic research involved qualitative in-depth interviews with children using collage boards.* The picture boards here were intended to awaken a sense of familiarity with a new theme and provide the opportunity for initial contact between the author and the children, free from any sense of expectation. The school classes were shown the boards and invited to pass them around, comment and ask questions.

The structure and aims of the project were made clear. The children were informed of the extent to which they could influence the course of the study and the extent to which they would be fulfilling the need for data collection, for presentation before people belonging to a university, and to those people within their town who were responsible for influencing much of their external environment. (In this case, the town of Weimar, *Grünfläche und Friedhofsamt*- the planning department responsible for open spaces.) Also emphasised was the potential of such a mutual co-operation to contribute to their own enjoyment and learning. This session lasted for one forty-minute lesson.

Week Two The Neighbourhood

The children were asked to create pictures of their homes, and their immediate neighbourhood. The session lasted, for one forty -minute lesson. The resulting drawings were collected the following week.

Drawing the pictures was to facilitate a discovery of the children's feelings for their familiar home environment. Sutton used a similar method, by encouraging the children familiarising themselves with concentric rings about their homes.

This stage was to enable a first reading of the *environment as text* thesis used by Titman, Sutton (and explained by Toffler,)[5]and the possibility of analysing images critically[6]. It is hard for children of this age to articulate what they see in spoken or written language. Drawing provides an outlet for the subjective qualities within the child's environment.

Week three Choosing Places and 'Important Things'

The limits to the children's neighbourhood were defined through a discussion process. These were marked onto a large-scale map of the town of Weimar. At this stage the children were encouraged to represent their environment as they saw it. These representations were to be valuable in identifying the needs of the children without necessitating verbal articulation. Drawings were chosen as one of the freest forms of expression for the child. The children were asked to list the places they felt to be most interesting and valuable to them from within their neighbourhoods.

They were asked the following questions:

Where do you most enjoy going within your neighbourhood?

Where do you like to stay and be; play, on your own, or with friends, to think, to escape, to meet people?

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5 Toffler, Alvin. Future Shock. Pan 1970 Pages 153-156. He explains the concept of coded and uncoded messages perceived from the environment – a form of hidden curriculum as defined by Dutton, 1991.

6 The critical examination of illustration. Taught often as Art Appreciation in schools, particularly for Advanced Level.

They were told that the following session would be devoted to marking these chosen places on the map. The number of suggestions was limited to one per child.

Using the adjectives: Interesting, beautiful, stimulating, scary, comfortable, noisy, strange, dirty, bad, green, quiet and secret, the children were encouraged not to restrict their choice by naming only those places normally worthy of adult approval. It was particularly encouraged that they feel free in their choice, without fear of reprobation for naming "forbidden territory'.

These places were given names by the children, and then written onto the blackboard, so that every child could see. It was stressed to the children that they could take time to think more about the questions if they wanted to - until the next session. They were asked to write their suggestions on paper in preparation for the next session.

This session was completed in two forty-minute lessons.

This stage was designed for the children to confront what elements in their environment were of importance to them.

Sutton's *sustainable physical contexts* and, the *emotional affinity* theory led to this identification of the places, which the children viewed as important to them.

An analysis of these places can reveal what elements and processes within the physical environment generate bonds of affinity for the children. It is important to find out why they chose these environments and not others. The method was so formulated that the children would be freed from the usually expected adult value judgements of their choices. The choice of adjectives was aimed to free the children into revealing their special places. This non-directive stance, gleaned from the educational work of the Wilds is important in order to gain real insight into the thoughts and wants of the children.

Week four Walkabout

The children were gathered into a circle and the enlarged map of their area (1:2000)[7]was placed in the centre. Each child was asked to mark on her or his chosen place (with necessary guidance for map-reading skills) with a small symbol; a slide, a house, or a tree etc. From these chosen places two routes were worked out, to allow the maximum number of possible places to be visited within one time. Over the space of two, 2-hour sessions during the week, these routes through the neighbourhood were explored

At each place, a pause was made and the children were free to explore the chosen area. They were then asked the following questions:

"How do you feel here?"

"Can you play here?"

"What can you do here?"

"What could you do to improve this place?"

Often these questions were not verbally placed as the children immediately responded to some places with activity, rendering the questions superfluous and observation the necessary tool.

The children were asked to draw the place which had most interested them to hand in the following week. These drawings were begun during class time and mostly finished within the children's private time at home.

The aim here was to establish what basic similarities or differences of perception might exist amongst the children.

Each place visited was subsequently photographed and analysed.

The drawings completed by the children after their tours served as an additional personal expression of what the children appreciated about their chosen places. The comments collected en route served as extra subjective material useful in considering the qualities of

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7See figure 50

the places. The deviance in response between positive and negative was useful in hi-lighting areas to which to pay special attention during the analysis.

Those comments collected during the tours were noted with indication as to male or female preference of place and teacher reaction. The analysis of the drawings was accompanied by the written verbal comments of the children as a means to indicate their reason for preference.

In investigating children's place preferences, children select very different types of places when interviewed in a traditional manner than those selected when they are given the opportunity to lead an investigator to those places. In particular, children identify many more small places valued for particular uses on 'place expeditions' than during the interviews."[8] The experience of Roger Hart and the importance given to self-discovery by the Wild pedagogic of active learning, lead to the decision to walk around the sites with the children. Just as the Wilds observe the pupils at their school in order to identify their needs and interests; observation and sometimes discussion with children in the environments identified reveal much more than if the work had been confined to the classroom. Visiting the sites gives the children the opportunity to actively express their opinions.

Week five Voting for a favourite place

This should be a place, which you feel to be yours - where things can happen. It should be a place where you would be glad to go to, where perhaps you will want to do things together. It should also be a place where you will want to go on your own - to be excited, to play, to talk, to think, to wonder....[9]

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8 Hart, Roger. Children's Experience of Place Irvington Publishers inc. 1979

9Wendy Titman in the Learning Through Landscapes project, "Special Places, Special People", found that," The environment was required to offer the potential for children to 'do' and 'think' and 'feel' and 'be' all at the same time."

From those places chosen and drawn from the previous week, the children were asked to vote for one place, which they would favour. A list was established upon the blackboard of all the possible choices, from which each child should select one choice. It was asked that the children have their decisions firmly made 'in their heads' before being asked, to reduce the pressure often exerted by the choices of peers. A majority vote decision led to the choice of one 'place' within the children's neighbourhood. The children were asked to draw the place, and to think about what they could do to improve it.

This chosen place was to act as the mean against which to measure the quality of the children's general environmental experience. It was also a means to assess what were appropriate physical settings for these children, based on their needs. It was deemed necessary that those places chosen should be analysed in terms of their capacity to trigger value formation. The assessment of the degree of 'sustainability' of these representative environments was to act as a key to the relative poverty or richness of the children's environmental experience.

The results for the voting were presented in tabulated form in order to show the degree of difference of opinion within the group.

- generating the research methodology

Sutton, Hart, Wild and the CRC identified the right of the child to participate in decision-making, which affects them. To narrow from eighteen different 'chosen places' to one is difficult. The method used, although not wholly convincing was an attempt to exercise this right. Fabian and Proshansky have suggested that, *place identity is.. a substructure of the person's self-identity that is comprised of cognitions about the physical environment that also serve to define who the person is.*[10]They believed, like Sutton and others that, the child's action of interpreting his environment as form constructs of symbolic meanings

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10 Quoted in Special Places, Special People, Page 8, from: Proshan sky, H and Fabian, A. The Development of Place Identity in the Child. Published in Spaces for Children. Weinstein and David (Eds) 1987 Plenum Press. ISBN 0 306 42423 1

(given to it by the dominating culture), is a building block of the child's development of personal autonomy and his ability to influence his environment. They write, *we form judgements about places; who they are for or belong to; whether they can be 'owned'; whether they are places 'for me' or 'people like me', and what we can do in and with them.*[11]

The children's choice of place was to be evaluated as a key to the way the children define themselves in relation to the external environment. Place identity and self-identity are related.

Week six Drawing on improvements

The children were divided into groups of two, three or four, (depending heavily on the teachers' assessment of their ability to work well with one another).

The children were asked to draw their ideas for elements which needed attention or improvement in the chosen place, and their own suggestions for its' future. The quantity of proposed change to the place was left to the children's judgement. The place should conform to their ideas of how it should look, function, and its' experiential quality. For example, suggestions for management of the area[12], or in the flexibility of the arrangement of objects present[13] were also encouraged, as well as new introductions, alternative use and/or users for the place.

Each group was given a roll of paper, sufficient to allot one A4 sized area for each child. It was left to the decision of the groups themselves whether they would cut this up into individual sheets, or maintain the long format. Also open, was the question of 'who' should draw. The children were given two forty minute periods in which to complete their

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11 See above, page 7.

12Titman found that simply involvement of children in maintenance greatly enhanced their feeling of responsibility for their environment.

13Titman finds that 'a key factor to the successful design of (school) grounds related to the extent to which they offered diversity and were manipulable by the children. This finding is consistent with all other research we could find relating to both school and non school environments used by children." Page 107 Special Places, Special People

expressions of their ideas The groups were mostly of mixed gender, and the drawings were collected at the end of the sessions.

Confronting the place by drawing positive and negative attributes and evolving possible solutions was necessary in order to address the final stages of the project. The children would require a detailed knowledge of the area they had chosen; their 'analysis' being the representations on these drawings. For the immediate purpose of research the look, function, and experiential quality of the place expressed by the children would give more insight into what the children valued in their environment and therefore what were their perceived needs.

- anticipated method of result tabulation

The drawings were presented with brief analytical descriptions. A second stage of analysis was anticipated. This involved taking a cross-section from the larger sample. The findings are presented in chapter 6.

It was important to find a methodology, which would give the children an outlet to their opinions about the quality of their physical environment. The lack of research, which Titman alluded to, in, this area led to the choice of graphic documentation of the children's ideas[14]. The graphic images could invoke discussion among the children themselves with minimal interference from the adult. The additional freedom given in the choice of format for the presentation was intended to enrich the depth of analysis. The group's choice to work in consensus or to create individual proposals could later provide interesting material when correlated with the images represented.

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14 Jean Piaget detailed the difficulties in obtaining un-biased research data from children. His book, The Child's Conception of the World is helpful here in describing the pitfalls, which any researcher can encounter when seeking information from the child. 1929 reprinted in 1951. Paperback version: Littlefield Adams ISBN 0 8226 0213 X

Week seven Idea exchange

Walther Rathenau School

Each drawing was given a number to represent the group, names were avoided. The drawings were exchanged between groups, A going to F, B to E, C to D. Each group was asked to comment on a separate written sheet, on the positive and negative aspects of those ideas represented.

This session took two forty-minute lessons. Both the teacher and the author circulated continually from group to group, saying little or nothing about the drawings themselves. Talk was restricted to explaining the task, smoothing out disputes between groups, or challenging the children to look deeper into their own evaluations. This was done through questions such as, 'Do you think group B has drawn all the problems which exist at this place?', or, 'Do you think group B's ideas would work, or would they need to have anything added to them?'

The twelve chosen children moved into a separate workroom, providing more freedom of movement, which became necessary in the next stages.

As a result of decreased numbers, it was decided to critique the drawings from the preceding stage as a group. Each drawing was placed in the middle of a large table, and the children gathered around. A list was created on the blackboard for those elements of which the children approved for their chosen site, and of those deemed unsuitable. As each picture was examined in turn, many of the elements became recurring themes. In order to give a final quantifiable judgement to each element, a vote was held:

Those who believed the element should be introduced held up their hands. When all the votes had been cast for each element, it was decided that those elements, which had received ten or more votes, be included in the new model for the place.

A final opportunity for incorporating other elements or alterations was provided by asking the following questions:

"What about using other elements; have you thought about the sun, wind, rain, shade?"

"What about other animals who live outside; birds, insects, plants?"

"Is there any way you could introduce any of these to your place?"

This was designed as a method to double-check and increase the depth of analysis of the previous week's work. Group counselling was encouraged in Sutton's work, producing unexpected results. The comments on exchanged drawings are listed next to the original drawings for ease of comparison.

Week eight Theme listing

The children were reminded of the content of the next four sessions: to create a model of their chosen place, complete with those alterations and additions which they believed to be necessary in order to exist as a place which they could fully use. It then became necessary to reach some consensus on what those alterations and additions should be.

Walther Rathenau School

Those features from the past week, which occurred more than twice, were written onto a black board. The children chose which ideas they would like to actualise on a model. The elements were categorised according to natural: vegetation, water, animals, weather and, man-made: play equipment, seating, built structures or walls, and surfaces for ease of collation.

The children were asked to think about their chosen elements and to collect materials useful in their construction.

The session duration was one forty-minute lesson.

The choice of elements was to serve as the symbols for the children's cultural expectations. The correlation between psycho-socio-economic context and the children's expressed needs was expected to reveal much on the role of the conditioning power of varying degrees of exposure to elements of the natural and man-made environment. The lists of elements to be introduced or changed within their environments were to act as a gross measure for the failings of the children's current environment. It was expected that

these new introductions could not always be considered sustainable but that they would indicate what the children would provide themselves with, given the choice, to fulfil deficits within their environment.

The problem of genuine democracy reappears. Choices would have to be made to limit the scope of improvements, which the children had suggested because of limited time. It was hoped however, that the introduction of the intermediate stage of cross-critique would increase the chance of opinions being shared in the final choice for the place.

Allowing the children to choose what they would like to construct fulfilled the criteria of empowerment and ownership used by Sutton, Hart, and others in the process of active participation. The argument that the sense of personal identification between the child and the object to be constructed would enable the children to overcome difficulties in the construction and in the collection of materials has been detailed in Rebeca Wild's writing.

Week nine Visiting the Chosen Place

The children were asked to test their ideas out in the field, and question if they could function. Having first studied a scale drawing of their chosen place within the classroom, and identified known 'landmarks' in a game, the children were to walk to their site. They were asked to plot out where the alterations or new elements should be placed onto the ground. The session lasted for three forty-minute lessons.

The final chosen positions were penned onto the plans.

- generating the research methodology

Sutton advocates a process of gradual familiarisation between child and her environment before any action of improvement can occur. This methodology adhered closely to Kal's, Montado and Schumacher's findings of the development of emotional affinity. The process results were not to be seen as individual stages, but as the cumulative result of the entire 13 weeks where reflection and action were to be integral to the process.

This, coupled with hands-on sensory stimulus and action in the environment to be reflected upon results in the connotative learning defined by Wild.[15]. Agreeing with Piaget that this form of active/ reflective learning is a means for the child to understand the 'meaning behind his actions', it is appropriate that any method engaged in assessing the responsibility shown by children towards their environment provide them with a methodology which encourages this manner of learning. The method itself acts as a vehicle for the child to exercise responsibility.

Weeks Ten and Eleven Constructing the Ideas

Working as individuals or as groups, the children spent the next two sessions in constructing their place according to their ideas. Materials were provided: wood, paper, card, modelling clay, dried plant material, glue, scissors, craft knives, metal mesh, bottle corks etc. with which to construct their proposals and create a three-dimensional model. The children were encouraged to bring their own material, and to experiment with the materials until they produced a product, which they were satisfied with. The sessions extended over a period of two weeks, each session taking up a whole morning of class - three, and two forty minute lessons. In order to check the validity of what they were building, the children were encouraged visit their site outside of school time.

The model was to be constructed for the benefit of the children. At this age, children appreciate the completion of a project. A model serves well to present the project to other teachers, children and those in the town responsible for planning the external environment. It was the author's intention that the children have some concrete result in order to retain a part of the project as a memory representing their empowerment. Where value from analysis could be gleaned would be in the differences of representation within

15 See Chapter 2 Stages of Learning.

the elements of the model, and in examination of new, spontaneously created elements not existing on any previous list.

The author intended to provide additional comments on the development of individual children during the course of the research, which could be of use for subsequent studies in environmental perception.

Week Twelve Admiring the results

The children finished their model and helped to set-up an exhibition of their work. The model was to be discussed in terms of how the place had been improved for the future, and the subject of sustainability and environment tentatively enlarged upon. The children were asked whether they thought their 'new' place would really be an improvement on the existing state.

The aims and documentation of the research were presented to the public authorities relating to planning and education in the form of commentary, drawings and slides. The presentation was to be followed by a loose debate of those issues raised by the study.

In Search of a Model Sustainable Environment

The Hütschenhausen kindergarten

The Hütschenhausen kindergarten is the third of three case studies and is an example of the *transformative* continuum, which Sutton proposed in her *Tapestry*. This kindergarten has altered its pedagogical strategy to allow greater freedom to the child's development, and has been planned and built by the office, Stadt+Natur with the children and parents of the Hütschenhausen community. The grounds were refurbished according to Stadt+Natur's philosophy *of near-natural appropriate settings for the developmental needs of children.* Based on the success of this project, Stadt+Natur have been awarded the responsibility of defining guidelines for the German region of Rheinland Pfalz. These

define what is necessary in the physical and social make-up of children's environments, which fulfil the expectations of Agenda 21 and the needs of the child. As such, the kindergarten is an example of sustainable design. The purpose of this analysis is to identify those factors, which make it so.

Using analytical tools complying with Sutton's warp, the Hütschenhausen project was assessed in the following terms:

1 To what degree have principles of sustainable design been achieved in the physical environment? To what degree is the project an example of a sustainable physical context?

2 What is the level and quality of participation possible by the child in her involvement with the kindergarten?

3 To what degree does the design provide sufficient opportunity for active experience?

This analysis is concerned also with examining the physical and social influences in the environment. Direct contact with the children is avoided, the author chose to glean the analysis through her own observation and that of the kindergarten teachers and planners. The concern is whether this environment can be labelled *sustainable* and conforms to the Agenda 21 guidelines. The analysis was based on a comparison to two sets of guidelines for sustainable environments.

This parallel case study of a recognised sustainable development was intended to bring clarity to the Weimar children's choices of environment: how would their choices measure against this *model*? By studying the mechanisms of empowerment introduced to the Hütschenhausen Kindergarten it was hoped to make conclusions as to the needs of children.

Introducing the Planners

Formulated by the design team of Stadt+Natur, Zweibrücken, the philosophy governing the design of this and other environments for children has been printed in several brochures sponsored by the Land of Rheinland Pfalz in Germany. Stadt+Natur are a German firm of Landscape architects specialised in planning environments for children. They aim to grant children the possibility of confronting elements of the natural environment in an experiential manner. The playgrounds and parks, which they plan and build, are planned using native vegetation and local materials and skills. The office was asked by the ministry for, *Culture, Youth, Families and Women*[16] to set down guidelines which could be used by other planners, schools, kindergartens, groups and institutions involved in creating outdoor environments for the use of children. Together with members of the Ministry for the Environment and Forestry[17] Stadt+Natur brought out a brochure entitled Wasser und Natur erleben. Ökologisch orientierte Spiel und Erlebnisräume[18].

Method for Analysis of Sustainable Physical Contexts

: to what degree is the Hütschenhausen Kindergarten an example of a sustainable development?

The design and implementation of the Hütschenhausen kindergarten environment was intended to minimalise long and short-term damage to the environment and act as a tool for children to learn behavior and values, which could lead future sustainable development. In order to assess this assertion, the Kindergarten was analysed according to factors of sustainable development put forward by a World Bank report[19], and by the 1996 BUND/Misereor report, Zukünftsfähiges Deutschland, which aims to set out a

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16 Ministerium für Kultur, Jugend, Familie und Frauen des Landes Rheinland Pfalz

17 Kinder in Rheinland Pfalz. Anregungen zur kindgerechten und naturnahen Gestaltung des Aussengeländes von Kindertagesstätten 1998 (Children in Rheinland Pfalz. Guidelines for near-natural design of the external environments of children's' learning centres.)

18 Translated: Experience Water and Nature. Ecologically orientated play and experiential space 1997. Available from the Ministerium für Umwelt und Forsten. Rheinland Pfalz, 55116 Mainz Germany

19Finance and Development - A quarterly publication of the International Monetary Fund and the World Bank December 1993 Article : The Economist's Approach to Sustainable Dev' 'opment by Mohan Munasinghe

The economic factors for sustainable development were published in this article.

sustainable future for Germany,[20]particularly with regard to the creation of local Agenda 21 plans. The aim of the report was to project an image of a sustainably developing Germany, *how can a democratically structured industrial state restructure itself so that the ecological limits are not impinged upon*[21]. The BUND study was designed to assess those factors, which contribute to and serve to restrict the path of sustainable development in Germany. The factors considered are: Health and Safety and Defensive or Preventative Costs, Removal of Material and, Use of renewable resources. The factors analysed disregard exact quantities involved. The analysis of the kindergarten was restricted to the external physical environment, which was planned by the office Stadt+Natur in 1993. The analysis results were intended to form a checklist, which could serve to guide other potential planners of play environments.

For the purpose of this analysis, the elements of the physical context are divided in to four categories:

1. Water
2. Material of plant origin (plants and timber products)
3. Material of other origin
4. Maintenance and planning aspects

Each of these categories were assessed according to the World Bank Report and BUND/Misereor factors listed below:

Effect on Health

In this case, safety of play is the measure of health. The analysis is based on the kindergarten director's remarks and those of the planners. Stadt+Natur wrote a report for the Land of Rheinland Pfalz, on play, and the legal implications of safety for children. The

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20 Zukunftsfähiges Deutschland. Ein Beitrag zu einer global nachhaltigen Entwicklung. Reinhard Loske and Raimund Bleischwitz Produced by BUND (Bund für Umwelt und Naturschutz) and Misereor. A study of the Wuppertal Institute, for Climatic change, environment and energy. 1996 Birkhäuser Verlag. Pages 43-53

21 Translated from BUND/Misereor report, page 10.

report concentrates on appropriate design of equipment and the provision for suitable challenges for the children.

Defensive or preventative costs

This factor indicates the degree to which the external environment precludes the creation of future sources of pollution and the degree to which its previous condition needed compensation. It includes analysis of the type, and origin of the materials used, the water balance, and the energy balance. Defensive costs are also those involved in maintenance and include consideration for the longevity of materials.

Removal of Material

This refers to the removal of any good from the environment, which naturally belongs to the local ecosystem. In the case of a quarry, this would be the rock transported away. The kindergarten is not virgin land, but organic material, such as soil dug from foundation excavation, cut and fill for ground relief modelling, compost material etc could be considered.

Use of renewable resources

Those resources, which come from renewably farmed timber plantations, are recycled, or those resources partly constructed using sources of renewable energy fulfil this category. The consumption of energy, is lower when re-using old materials. This results in less negative impact to the world energy balance.

The resources used on the site of the kindergarten, and those, which have been used in the provision of materials or in energy consumption in the construction of the kindergarten grounds were additionally evaluated. The use of manual or machine generated labour was also considered in this balance.

Method for Analysis of Democratic Governance Structures

These factors were measured against criteria for sustainable physical contexts listed in the Agenda 21 in order to ascertain Stadt+Natur's success.

This second section addresses question 2 what is the level and quality of participation possible by the child in her involvement with the kindergarten?

There are several layers of participation to be studied:

1 the daily running of the kindergarten

2 the planning of the physical environment

3 the building of the physical environment and,

4 the maintenance of the physical environment.

Each of these situations has the potential to exert long-term consequences in the manner in which the children relate to their environment. The four layers are documented in a narrative form which aims to show the process of democratic decision-making and co-operative action which Sutton deemed to be an essential part of the transition to a responsible sustainable society.

Method for the Analysis of Empowering Learning Processes

To what degree does the design provide sufficient opportunity for active experience? This third question refers to the kind of learning available in the physical environment of the kindergarten.

The planners aim was to create a place, which would foster the learning of personal responsibility and provide a setting where children could learn the values, which can lead to living sustainably.

How was this possible? What elements, special features or approaches can fulfil such idealistic criteria? Reading the environment as a *text*[22], which has the ability to communicate codes, signs, symbols and ultimately, values we can see what it is which affects the children in this environment, and how it does this. The author has already quoted Wendy Titman's connection of these in her 1994 study. Proshansky and Wolfe also describe this, *Physical environments communicate symbolic messages about the intentions and values of the adults who control the setting.*[23]

Piaget has enabled us to understand more of the processes of cognitive development within children. He has shown how their method for assimilating and processing impulses from the external environment differs from the adult world. He has also shown that children learn through a relationship of activity. Personal experiences become the building blocks of a child's' ability to think. *The child is trying to construct a world-view on his own and is limited only by his abilities and his experience.*[24] We therefore have two ideas to consider:

A. To read the environment as a text, which is the study of semiotics.

B. To assess the possibility and diversity of the child's potential for active experience.

To further qualify this structure for analysis, two more terms must be introduced, coded and un-coded texts:

Coded texts are, *any which depend upon social convention for their meaning*[25] Virginia Valentine of Semiotics Solutions, who co-designed Titman's research, further defines them as, *individually communicating a 'message' to (the) children about the use they are 'supposed' to make of a space. How they should 'be', what they should 'do'.* This could also be referred to as the kindergarten, *hidden curriculum.* The environment contains *signs* to be read by the children indicating what they are encouraged, or discouraged to

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22 See page 16. Titman,W Special Places Special People. Virginia Valentine of Semiotic Solutions explains the semiotic approach used in the formation of techniques for accessing children's perceptions.

23See Proshansky, E., and Wolfe, M. The physical setting and open education In, School Review 1974 Quoted in Special Places, Special People. Titman. 1994. Page 79

24 This has been thoroughly explored in the work of David Elkind; Children and Adolescents, where he explores and interprets the work of Jean Piaget. Rebeca Wild uses this theme of activity for her work in the Pestalozzi Schools, where self-propelled activity is the medium by which the children learn.

25 Toffler, A. Future Shock Page 154

do. These will be thoroughly explored in the text below which list both forms of texts read by the children in the environment of the kindergarten grounds.

Un-coded texts refer to 'messages' which are, *not, in any ordinary sense of the term, man-made. It was not designed by anyone to communicate anything, and the man's understanding of it does not depend directly on a social code - a set of socially agreed-upon signs and definitions.*[26] Nevertheless, these are messages and influence the structure of our cognition just as coded messages. These can also be referred to as messages, which are, *unpredictable.*[27]

What is interesting to measure here, is the strength of these coded messages in the kindergarten grounds. Many of the elements already identified are of such a flexible nature that the experiential scope for un-coded interpretation is wider than that which is coded. The children have great freedom to read the elements of the kindergarten according to their own fantasy and the freedom to choose from a wide range of stimuli.

Among this diversity are those messages which will conform to the child's own internal cognitive structure. The hurdles of adult pre-interpretation do not loom as large when the majority of the texts are un-coded.

The playgrounds studied by Titman showed just some of the perceived coded messages which children had identified within their play environments: *Our research suggests that the Hidden Curriculum of school grounds is made up of a complex web of inter-related messages and meanings which are un-stated but assumed, which children read, not only from the physical aspects of the grounds but from traditions, practices and the attitudes of those around them.*[28]

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26 See Future shock Page 154

27 The Günter Beltzig of the German company Playdesign, identified this as one of the key elements missing from environments for children in a lecture given to the Congress; Spielraum und Bewegung: Was Kinder brauchen, February 1998. Two generations ago, such experiences were more available than now due to the proliferation of natural environments.

28 See Special Places, Special People. Titman, Wendy. WWF/ LTL 1994 Section two contains detailed descriptions of elements identified by children as signifiers in their environment. Pages 55 – 63 are particularly rich.

The most obvious semiotic 'messages' in the Hütschenhausen physical environment are presented in a table form, where the interrelated nature of the subject can best be expressed. Accompanying these semiotic messages are the possible activities and learning processes, which are enabled by this environment. It is necessary to state here that we are not comparing this environment to any other. What can be offered here is an analysis of the elements, which go into such a sustainable design and the resulting processes, which bring the child along the path of independent, responsible learning.

Chapter 6

Weimar Schools Results and Analysis

The data for the Weimar schools and the Hütschenhausen Kindergarten are presented in two separate chapters. The data is documented in chronological order, each section provided with a preliminary conclusion. The analysis is summary at this stage in order to gain an overview of the processes at work. Final analysis of a smaller selection of children is presented in the concluding chapters.

Week One Introduction

The project was given the go-ahead by the parents of the two classes, their teachers, headmistresses and the Department of Education for the Land of Thuringen in Germany.

Week Two Neigbourhood Drawings

Analytical comments are included below the descriptions of the pictures rather than in a separate section for ease of reference. The following factors were used in describing the pictures:

1. Personal identification and Human Presence
2. Colour
3. Form and Composition
4. Presence of Detail and Pattern
5. Similarity to the Objective Reality

<u>Case Study 1:Walther Rathenau School</u>

Tim

1. There is no label to Tim's home

2. Tim uses four colours in his drawing; sandpit and house share the same yellow.
3. The sky and roads are shown both as plan and as elevation, at the bottom right is an empty corner.
4. The windows are accurately shown, with the exception of one row, Tim also shows the direction of traffic in his street. Tim shows the traffic circulation and all possible parking spaces in his homes' vicinity.
5. Only Tim's house and the neighbours are shown although the houses are terraced. Separate, tall houses are shown.

Analysis: Tim's cognitive map consists of, indefinite 'sea' of concrete, house, road and in a far corner (across the street), a sand pit. Interestingly Tim has exaggerated those elements for which he shared a particular affinity. He used colour as a tool to give more legibility to those elements, which he felt to be most important.

FIGURE 10 TIM'S HOME

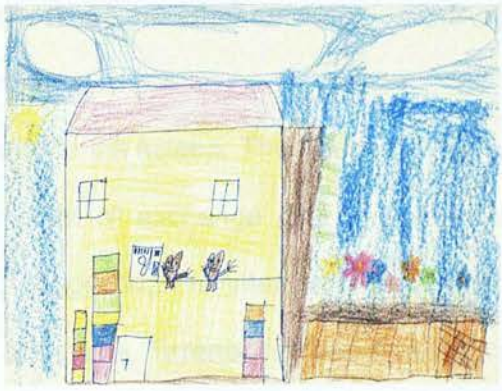

FIGURE 11 STEVE'S HOUSE

Steve

1. Large house number
2. Coloured glass windows are made-up
3. The house is the central feature; the garden is shown partly in planview.
4. Many small details have been drawn: diverse flowers, two birds, an espalier tree, the sun and clouds and earth and coloured stripes.
5. Steve's home is actually semi-detached.

Analysis: Steve loves his home, using friendly pastel tones, and lively to surround the house. He has gone to great lengths to give his house a sense of complexity through the portrayal of these small-scale elements. From the drawing one could guess that Steve lived in a small country cottage, not the tall semi-detached house of his busy street. He has made out of his environment that which he wants to see, rather than portraying an objective view of reality.

Terence

1. No number but detailed front door.
2. Drawn in shades of blue, grey and red.
3. No garden has been drawn, instead, the sky surrounds the building, and the two almost merging; house and sky are given the same colour.
4. The smoke, coloured chimneystack and doorknob are small details.
5. Terence's house is terraced and not detached.

Analysis: Terence' house looks as if it is ready to fall asleep. The house has an almost a face-like quality, the front door is the only point of exchange with the external world. Terence has drawn more door than house, suggesting his intentional emphasis on the aspect of transition from the outside world to the inside. Terence to describes his means of retreat from the external environment.

Manuel

1. No house number
2. Colour is used to exaggerate the house (in reality, the yellow is paler) Manuel uses six colours.
3. The house dominates the page

FIGURE 12 TERENCE'S HOME

FIGURE 13 MANUEL'S HOME

4. Manuel shows rain and wind (blowing chimney smoke and bending tree), clouds, raindrops shrub and a puddle. He uses ruled lines for the built elements, and draws the natural elements freehand.
5. The house is drawn as a detached villa, but is actually semi-detached.

Analysis: The use of ruled and freehand lines suggests his recognition of two distinct orders: the constructed man-made, and the organic forms of nature. Both the elements of the external environment and his house appear in equal weight on the picture, despite the recognition of the existence of the two orders.

David

1. No house number but the doorway is detailed. David's flat is shown with coloured curtains.
2. The colours of the pavement are reflected in the architecture, and the blue of the sky can be found again in the stripe on the building and the front door. David uses six colours to draw his house.
3. The house is drawn in the middle, between the sky, sitting on the earth and flanked by an excavator and a shed.

4. The colour palette is repeated with an even distribution about the elements of the drawing. The doors show the heads of many people living in the house.
5. David's house is semi-detached.

Analysis: There is the suggestion of a balance in the relationship between the natural environment depicted by the sky, and the colour on the house. David draws what occupies him in his neighbourhood. The excavator which has been working on his street for weeks is an expression of his concern with the events going on around his home.

FIGURE 14 DAVID'S HOME

FIGURE 15 MICHI'S HOME

Michi

1. Michi's own window is labelled *my house.*
2. The facade of Michi's house is a dull grey. Sky and house are drawn with a similar intensity.
3. The building is pushed to the right of the page. He indicates the presence of his neighbours with a fine sliver of house, divided from his by the sky.
4. The 'life' of this drawing comes from what happens within the house: In one window grows a plant, from another floats music, and his has curtains.
5. Michi omits the tangle of fences and smaller buildings, which disturb this view.

Analysis: The building is depicted as a shell to contain life, the building is not inherently showed to possess life. (This has often been associated with the tendency of young children to draw smoke coming from a chimney, indicating that the house itself is somehow a living being to the child). Without people, to populate

the house, the place would be lifeless, which indicates that Michi's home lacks a secure sense of place which would enable the house to stand on its own, without the presence of people.

Patrick

1. There is no number.
2. Patrick uses seven strong, clear colours.
3. Patrick's house is the only object on the page.
4. Patrick drew a hole in the fence, coloured curtains, twisting smoke and four windows.
5. There are no signs of neighbours although the house is semi-detached, and nothing inviolates the property border. The house has in reality four floors, and many more windows.

Analysis: 'My home is my castle' could be Patrick's motto. The solidity and security of this single house describe Patrick's strong sense of ownership, which he revealed in his conversations. Patrick seemed to hold on strongly to this subjective reality having recently experienced the loss of his mother from the family. The house belongs to the family, who live in the various flats.

FIGURE 16 A PATRICK'S HOME

FIGURE 17 SEBASTIAN'S HOME

Sebastian

1. There is no number at the door.

2. With four colours, Sebastian uses strong colour for the house, but draws a neutral background.
3. The house is centrally placed, surrounded by the rain.
4. The rain does not cover the house façade. The door is drawn below the level of the windows. The windows are strongly defined.
5. The house is separated from the neighbours by two narrow gaps; it should be possible to see the neighbours on Sebastian's drawing.

Analysis: It is raining! But Sebastian's house still shines bright...His house dominates its environment. This domination suggests that Sebastian is proud of the size of his house. There is no way of telling which of the windows belongs to him, which would otherwise reveal his sense of ownership.

Martin

1. There is no house number shown.
2. Colours are indefinite except for the door, windows and porch.
3. Martin has chosen to cover the page with his house. A strip of sky and of road have been squeezed, each window has an individual form.
4. The handle of the front door is positioned low enough for a child to reach
5. The lean-to at the right is coloured brown, like the window frames, in reality they are painted white and metal.

Analysis: These houses were built with the human frame as a scale reference, during the early period of Soviet Germany's DDR. The scale of the building and the interior give clues as to the materials used in construction, which Martin reveals in the wood colour chosen for the window frames These houses, although run-down from thirty years of socialist neglect, are a good example of social housing, and are easily identified as landmarks.

FIGURE 18 MARTIN'S HOME

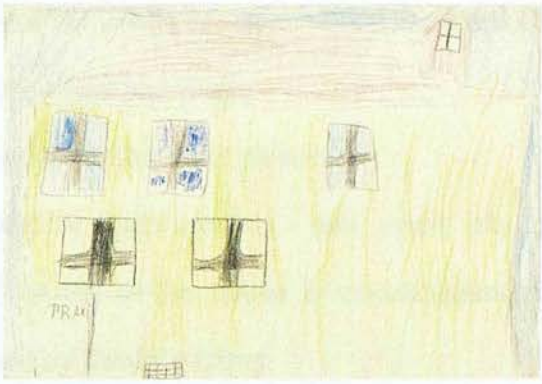

FIGURE 19 BENGT'S HOME

Bengt

1. The door is hard to read, and is decorated with the sign, *practice*. Bengt has coloured the windows of his flat blue.
2. The colours are pale, and little contrast exists between the elements.
3. Dotted lines used to define the shape of the house indicate the vagueness with which this has been drawn.
4. Small roof windows, cellar gratings and coloured blue windows are Bengt's details.
5. Sky is shown to surround his house, but Bengt's house is semi-detached along a street with dense housing.

Analysis: Bengt's vague lines depict an ambiguity surrounding his home, which he has simultaneously labelled as office. Cellar and attic are areas within this faceless house, which he views as interesting.

Daniel

1. Daniel's house has been carefully labelled with a number, (drawn twice, as the first attempt became lost in the colouring process). He has identified it further by labelling the Butcher's shop, and 'painting' his surname onto the roof.
2. Seven strong colours are used.
3. The house is drawn as part of a composition of built-up area and landscape.

4. The house itself has an impossible number of windows, all of which are blank. Prices in the butcher shop are shown steps, sun, cloud and grass.
5. The house has actually only five stories and not the eight shown.

Analysis: The external environment is given far more concern - sun, cloud, sky, grass, the steps and house of the neighbours. The life of the house is concentrated on the outside, and in the butcher's window – owned by Daniel's father.

FIGURE 20 DANIEL'S HOME

FIGURE 21 TONI'S HOME

Toni

1. There is no personal identification.
2. Three bold colours are used, and with great effect of contrast.
3. The house and sky occupy a 50%-50% relationship on the page.
4. Each of the three windows is treated differently; the fence and chimneystack are textured.
5. The house is in reality larger, and the surrounding fence, smaller. Neighbouring houses are immediately adjacent.

Analysis: Toni's house is shut off to the outside world; the high fence is firmly closed, as is one of the shuttered windows. The house stands alone, surrounded only by the sky. (Very definite strokes.) Toni acknowledges a communication of his house with the sky and not with the earth.

Christian

1. Christian has pictured himself by the doorway to his home.
2. Four colours are used, as three large areas or blue, yellow and red, and as accentuated points.
3. The picture is balanced between house and sky, which take up equal space.
4. The lines are most irregular, but show much detail in the kerbstones, drainpipe, doorways, weeds, windows and people.
5. The actual house is far more regular and less lively.

Analysis: The house sits in the earth and communication between people takes place in front of it. Christian's jolly, bright picture seems to be a part of the ground.

FIGURE 22 CHRISTIAN'S HOME

FIGURE 23 LUISA'S HOME

Luisa

1. The house is clearly labelled above, *my house*.
2. The five colours used are strong and evenly applied.
3. The house covers the page, centred on Luisa's door.
4. The detail of the door, clouds, windows, drainpipes and chimneystack are carefully drawn. The window-frames are given a variety of treatments.
5. The house is in reality far less bright but other wise accurately represented.

Analysis: Luisa has chosen to portray her house from the street side, like most of the other children. Her garden is worked by her grandmother, who Luisa associates, with bringing life into her home and is full of 'old-world' charm.

Janett

1. Janett's house (26) has been given a number; the street has a sign showing its name.
2. The curtains of her house have a different colour to the neighbours, whereas the house colour remains constant. Five colours have been used.
3. The houses are positioned to the left side of the page, 50% of the paper is the sky.
4. Janett's drawing shows an unusual distribution of windows on the facade. Her doors are drawn large.
5. The scale of the houses is greatly distorted. Each house has five stories, and the windows begin on the ground floor unlike Janett's representation.

Analysis: Janett has sought a way to personalise non-descript architecture. The number sign aids her in the illusion that her house is an individual member of the continuous band of terraced housing, which comprises her street.

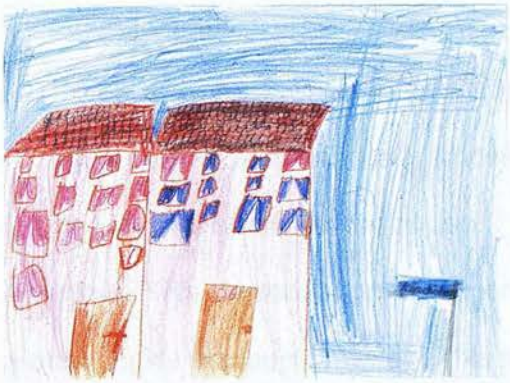

FIGURE 24 JANETT'S HOME

FIGURE 25 REBECCA'S HOME

Rebecca

1. There are no numbers or personal identification.
2. The drawing is strongly coloured using four shades, and the house is boldly outlined in black.

3. The black outline of the geometric house neatly divides it from the garden in which it lies. The clouds are the only irregular details.
4. The roof tiles are lavished the most detail.
5. Rebecca' house is pictured as a villa, rather than in the dense neighbourhood of the town.

Analysis: Rebecca draws her house as though shut off from the world. It is important for Rebecca to be able to identify her own door. The half-covered windows suggest that the house functions more as a place for retreat, rather than as a place to want to look out from. Only the colour of the curtains express something of the character of the occupants.

Sara

1. Sara depicted the inside of her home, drawing her room, herself and her friend, Jenny
2. She used nine colours to describe the room accurately.
3. The room is represented as the entire house, complete with roof. She and her sister stare out of the picture, dwarfed by the heavy wardrobe behind them, and the bright striped carpet.
4. Detail is in the faces, the furniture construction, small toys and the carpet. The two figures are almost identically dressed, although one is shown larger than the other is.
5. The room is shown as the house.

Analysis: This interpretation of the brief given was based on the small sketches shown around in the introduction week. This is Sara's most personal world, the place where she possesses the most influence, hence her depiction of her room as the entire house. This is the sphere, which she is allowed to influence, rather than the outside world- for which there was no reference in her pictures.

Jenny

1. Personal objects are drawn, but Jenny is absent.
2. Ten colours are used for an accurate portrayal of the details.

3. The room is contained within the boundaries of the page - a white strip acts as a frame for the drawing.

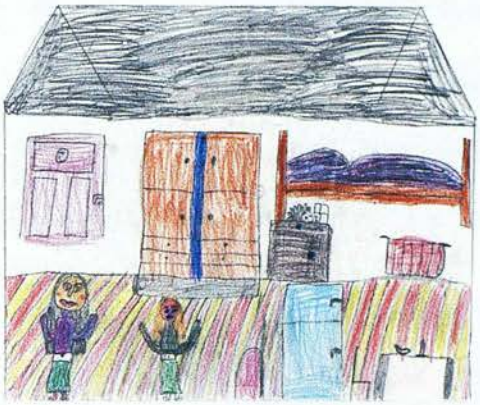

FIGURE 26 SARA'S HOME

FIGURE 27 JENNY'S HOME

4. Jenny has drawn a most detailed room, showing her pets, the light switched-on at her desk and the decoration. Furnishings and toys are accurately depicted.
5. Scale and spatial structure are accurate.

Analysis: This is indication of her interests. There is no indication of a window or a door, other than the suggestion of a sloping roof-light. Like Sara, her room is where Jenny may exert her influence, and she is restricted in her freedom of movement outside the home for fear of abduction.

Kristina

1. Kristina has labelled her drawing *my bedroom* and placed herself centrally on the picture.
2. Using six colours, she has produced a bright drawing, full of contrast.
3. Kristina's room is drawn using two different perspectives: her bookcase and bed are firmly anchored on the (brown) floor. These are stable elements, providing a clear structure to her room. Kristina 'floats' on the blue background, which acts as wall and floor.

4. Four areas of detail depict four different functions: toys, fireplace and lamp, chair, and bed.
5. No window or door is depicted. Kristina has drawn two grounds: the blue carpet, and a brown stripe upon which her bed rests.

Analysis: suggesting a certain discrepancy between her own needs and the structure of her environment. A lamp on the wall indicates some end to this space.

FIGURE 28 KRISTINA'S HOME

FIGURE 29 EUGENIE'S HOME

Eugenie

1. Eugenie has not depicted herself, but two of her drawings.
2. She uses rainbow stripes and eight colours for her room.
3. The elements are drawn on the same plane.
4. Eugenie uses colour to reveal the detail, such as the streaming lamplight.
5. The scale of the lamp and the bed are inaccurate. Colour is used impressionistically rather than accurately.

Analysis: Eugenie creates her own piece of the world down to the last detail of colour. The window is shown with the curtain pulled, suggesting the retreat afforded by this very personal space.

FIGURE 30 ANNE'S HOME

Anne

1. Anne labelled her picture, *my room*.
2. The colours are lively and fill the page.
3. The objects of the room are drawn along one plane.
4. Many details are given of her possessions: the key in the wardrobe, the rabbit, and the stereo.
5. The view from her window is made up. Anne is the only one of the five girls who chose to draw a view.

Analysis: Anne has coloured furniture, which would otherwise appear dominant and heavy, with bright yellow. She has used colour and contrast to enhance the reality. This is her private sphere where Anne experiences enjoyment.

First Conclusions

- The children have an innate ability to make the best out of their environment. Often the colours they used were far brighter than reality, and where ugly urbanity pervades, they have envisioned great expanses of sky.
- These children were particularly alert to the effect colour can have in their drawings. Where several houses were represented, the one, which was 'home', would be given a brighter colour. Tim associated the colour of the sandpit (the only external space allocated to him) with that of his house. Terence's blue world indicates a distance between himself and his home, somewhere far away from the rest of the world.

- The use of fences and exaggerated size of the front doors, illustrate the children's attempts to hold at bay the world outside. The homes were often viewed as a kind of retreat from the outside world.
- In many cases it seemed as though the homes were indeed detached from their environment, isolated by neutralising agents of sky, grass, heavy black drawing lines, or simply blotting out all other influences by covering the entire page with the house.
- The children showed another form of 'wishful thinking', not only in their colour choice, but also in the materials depicted. Martin, for example, coloured his house window frames brown, like wood. Some form of internal construct must have conditioned him to suppose that *good* window frames are made of wood, allowing him to *forget* the facts that his window was made of ill-fitting draughty metal.
- Those children who drew their rooms were girls, most of whom had commented that their parents restricted them from roaming far within the neighbourhood. They tended to stay within the shelter of their homes and small back yards. Their drawings were filled with exact replicas of their own worlds.

Case Study Two: The Lucas Cranach School

Lydia

1. Lydia labelled her grey rectangle plan view house, *my house.*
2. Colour detail is to be found in the different cars and the two shades given to the building flat-roofs.
3. The way that Lydia drew the cars, entrances and grassed surfaces were disproportionately large to the roads and buildings. The presence of humans was left to be inferred from the man-made structures.
4. Each entryway to the two blocks of flats was shown.

5. The plan view is mostly accurate, although the tarmac areas are shown white and not dark grey.

Analysis: The real interest is in what she can see from her flat. Her perception of her immediate environment is formed by the view she has. She is too far up to see people clearly, her register of the passage of time and movement is in the fluctuation of quantity and the distribution of cars in the car-park below her.

FIGURE 31 LYDIA'S HOME

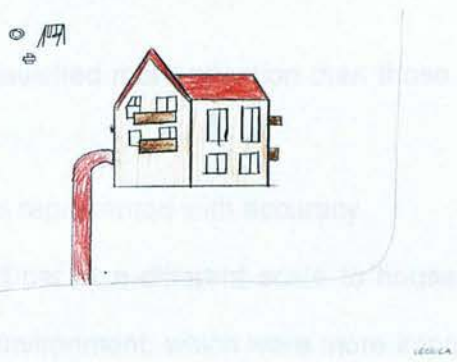

FIGURE 32 JESSICA'S HOME

Jessica

1. No personal identification.
2. Jessica uses three colours.
3. Jessica drew one detailed object in the midst of a sea of white, punctuated only by three small pieces of play equipment in a corner.
4. In the following order of importance, Jessica drew attention to: house, access path, place for play and property boundary, which are drawn with a ruler.
5. The space around Jessica's house is far less than is shown on the drawing. Neighbouring houses are far closer.

Analysis: Here too, was no obvious living presence. There appeared to be an absence of interest for Jessica, except for the play equipment, which were drawn freehand. The scale of which however is indicative of Jessica's relationship to her environment: powerlessness, diminutive and unimportant.

Eva

1. Eva labelled her drawing; *I live here* and drew herself on the opposite side of the street from her house.
2. Eva uses colour to highlight and decorate, the house opposite her is more brightly coloured than her own (and 'brighter-than life')
3. Eva placed her house upside-down on the page and used different scales for the representation of the elements.
4. Her house and that opposite her were lavished more attention than those of the other neighbours.
5. Apart from problems of scale, the area is represented with accuracy.

Analysis: Eva's drawing of child, dog, and car at a different scale to houses and trees established a hierarchy of elements of the environment, which were more important to her. Eva, like Lydia, included a wider area in her drawing. The larger house on the opposite site of the road defines the position of Eva's building. Eva uses reference points to place her home within a neighbourhood context.

FIGURE 33 EVA'S HOME

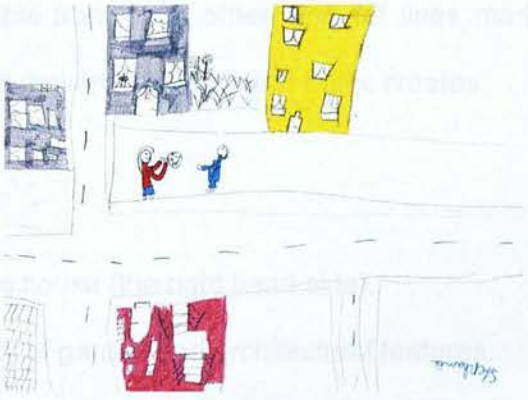

FIGURE 34 STEPHANIE'S HOME

Stephanie

1. Only by detective processes can one guess, which is her, house (the grey one, with a garden). Stephanie and Eva populated their drawings. Stephanie's children are shown actively engaged in their environment.

2. Stephanie uses colour to highlight and differentiate the houses.
3. Stephanie has used plan and elevation together.
4. The street is given no colour, but drawn with the lines of separation.
5. The street is more densely built-up than on the picture.

Analysis: Stephanie is idealising a quieter environment. She has chosen to portray those buildings, which stand out, for their colour and personal importance, as landmarks.

Janine

1. Highlighting the numbers on the doors marks Janine's house.
2. She uses seven colours to differentiate the flats from each other.
3. The house does not fit onto the page in its width or height.
4. The red and blue flowers contrast with the large black lines of the road.
5. Janine has reduced the size of the windows in her stylistic portrait.

Analysis: Janine has shown the sameness of her environment, which persists, despite efforts made to the contrary by its inhabitants (the coloured curtains and the flowers). Road and house are barely distinguishable from each other, and fat lines marking the centre of the road emphasise the barrier to movement, which the traffic creates.

Mario

1. It is not clear which area represents his house (the right hand side).
2. Mario uses six colours to draw a variety of garden and architectural features.
3. He has drawn his own and his neighbour's house from above; the house is located between two equal areas of garden.
4. Textures and colours illustrate flowerbeds, steps, fences, and ground surfaces.
5. The garden is given more emphasis than the house.

Analysis: Mario shows an active interest and attachment to his environment in his notation of garden details. His feeling for spatial layout is well developed; not only does he know his own home, but that of his neighbour as well. The house is not intended to impress with a representative effect.

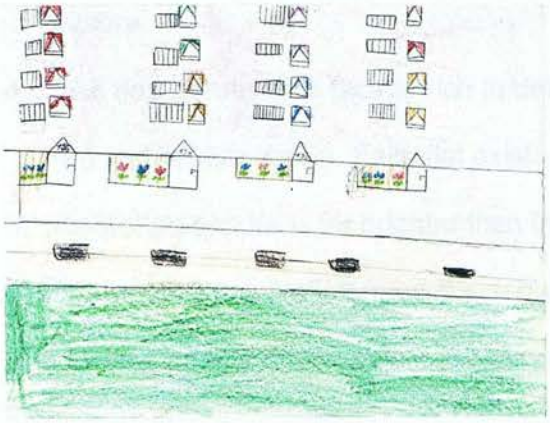

FIGURE 35 JANINE'S HOME

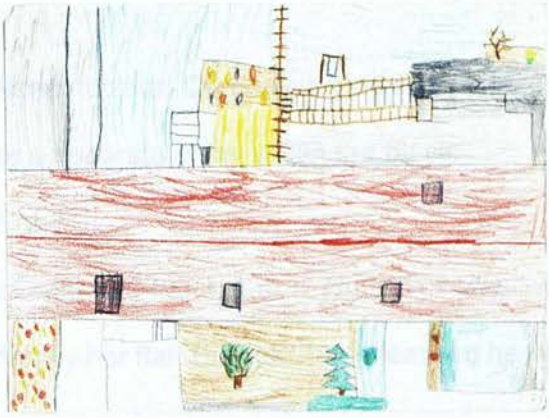

FIGURE 36 MARIE'S HOME

Robin

1. No personal identification.
2. Robin uses three colours and much white in his house depiction.
3. The house dominates the page, robin has shown his and other's entrances.
4. Robin presents a uniform façade. The corrected, square porch cover is the only hint at his identification with the middle entrance to his flat. The roof form and colour are incorrect; the roof is flat and the house is grey.

Analysis: This drawing gives no hints of any personal attachment with the subject matter.

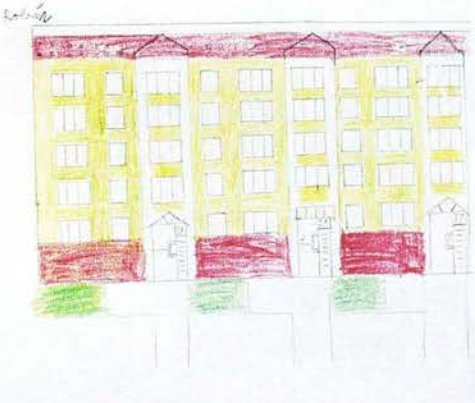

FIGURE 37 ROBIN'S HOME

FIGURE 38 CORNELIA'S HOME

Cornelia

1. The strong red colour and the people on the balcony identify Cornelia's house.
2. Using seven colours, patterns and mixes, Cornelia has created a rich picture.
3. The block is so large however, that it is the only element, which can be drawn on the picture.
4. She has portrayed a facade rich in detail and colour. Curtains, windows and balconies are individually drawn. Each flat exists as a separate entity within the block.
5. Cornelia's picture is far brighter than the reality.

Analysis: She has transformed the regular concrete block into a *Hundertwasser* vision. The waving people on the balcony clearly identify her flat. Cornelia has idealised her view.

Albina

1. Albina has drawn herself in the entrance to her house.
2. Albina has used ten colours to indicate individual flats.
3. The house dominates the picture amid the sunny grass.
4. Albina has detailed the common stairwell and the window treatments.
5. The house has been given a roof, which does not exist in reality. The projecting chimney and apparent isolation from other buildings is equally fanciful.

Analysis: Albina has portrayed diversity on the facade of her house, indulging in fanciful window treatments whose aim is to illustrate the ownership of the flats.

FIGURE 39 ALBINA'S HOME

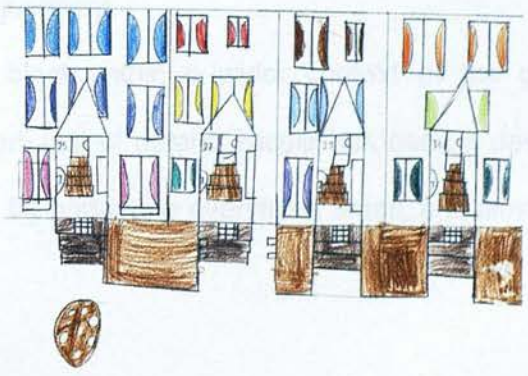

FIGURE 40 MARLENE'S HOME

Marlene

1. The house has numbers, but it is unclear which house is Marlene's.
2. Marlene gives care to differentiate the separate flats through eleven colours.
3. Marlene has chosen to 'shrink' her house, illustrating only the first three out of six storeys. She portrayed every entrance in her building block.
4. Marlene shows four separately drawn, but architecturally regular blocks of a large house,
5. Each entrance is accurate in its details.

Analysis: Chopping off several stories is Marlene's method to create a more appropriate human scale, whilst her curtains indicate a longing for individualisation and orientation.

Nicole

1. Nicole has written her name in one of the windows to indicate her own flat.
2. She has used twelve colours to depict the variety of window treatments with accuracy.
3. The house dominates the page, surrounded by a fringe of sky, earth, plants and the neighbouring house block.
4. Nicole has tried to depict the house accurately, and shown her fine knowledge of the house architecture and internal decoration: the individual front garden strips, hanging plants in the windows, and a sign, showing where she herself exists within this richness.
5. The spacing of the windows requires adjustment.

Analysis: Nicole has placed her house block within a wider context of the greater surrounding. Great care is shown in her portrayal of details; Nicole has used a device to reduce the apparent scale of the buildings, by portraying everything small, and illustrating several of the neighbouring house blocks.

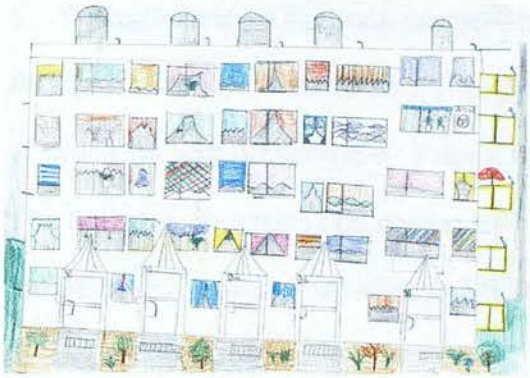

FIGURE 41 NICOLE'S HOME

FIGURE 42 PHILLIP'S HOME

Phillip

1. The houses are numbered, but it is not clear which is Phillip's.
2. Five colours are used repeatedly in the same pattern on the façade, leaving the interiors white.
3. The house and front gardens cover the page.
4. The detail is in the relative sizes of the trees, the flower dots, and regular pattern of the windows.
5. In its monotony, the house is fairly accurately drawn. The planting is in reality far less regular, the house is beige coloured and the numbers smaller.

Analysis: Phillip's drawing exaggerates the repetition in the environment. The only distinction to indicate a sense of place, other than the house numbers is in the size of the trees. He ignores any small sign of individuality, which for him is dwarfed by the overpowering sameness of his environment.

Christian

1. A plaque with names is shown on the door, but there is no indication as to which is Christian's.
2. Three colours are used.
3. The house façade takes up the entire page.
4. Proportions and details are correctly represented.

5. The picture is an accurate representation, except for the colour, which is paler.

Analysis: Christian has chosen to emphasise the stark quality of his house by the manner in which he has presented it. *It does look like,* the other children were eager to confirm. The house is dominant and seems to share no relationship to its surroundings; it appears fortress-like, closed off, as though requiring a password to obtain access– there is no way of seeing inside the building.

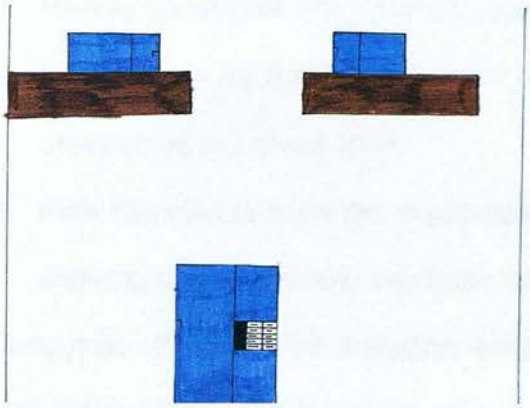

FIGURE 43 CHRISTIAN'S HOME

FIGURE 44 JOHN'S HOME

John

1. Number 48 is the sign at John's door, the other houses have been given no numbers.
2. Four pale and one strong colour are used to define the picture. John uses black to outline and structure his picture.
3. The picture has been divided into quarters: houses and playground having been given equal weight.
4. Doors and windows are carefully detailed, as are the playground elements: carousel, slide, sandpit and basketball net.
5. The spatial distribution is inaccurate; the playground is sandwiched between two rows of such houses.

Analysis: John has shown his house from the private side, away from the street. He attempts to show some spatial distribution for orientation. The door of his house is most

clearly defined. The playground is pictured with far less definition than any of the houses, even though it is in the foreground.

Felix

1. Felix's house and his parents' car shown, with his own name written on it.
2. Felix has chosen a palette of colours much brighter than the reality. Where he has drawn orange and pink, exists in reality, beige and grey.
3. He has considered it important to locate his home within the neighbourhood context.
4. Details such as the bus timetable and car, tree, and staircase are given as much attention as the house itself.
5. Felix has tried to show the neighbouring houses and activities. His house in inaccurate showing no entranceway and three rather than five stories.

Analysis: Elements of transport emphasise the importance placed on getting to somewhere else, such as weekend trips, visits to his grandparents' garden, or shopping. Felix has drawn the man-made elements with more knowledge than the natural elements.

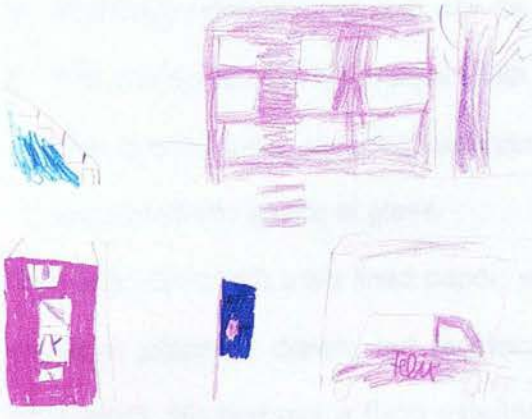

FIGURE 45 FELIX'S HOME

FIGURE 46 MICHAEL'S HOME

Michael

1. There is no sign as to which entrance is Michael's.
2. Two colours are used, and much white.

3. Michael drew the common green land surrounding his house block. Next to the strength of the (twice drawn over) green, house and road pale into insignificance. He has used he plan/elevation view.
4. The windows and markings on the concrete slabs have been carefully documented, as are the neighbouring house steps.
5. Michael has a good feel for the spatial distribution of the housing blocks and the areas of green.

Analysis: Michael has given the road and the house the same weight within the drawing. Both are his home: the one is a small interior space, the other a large even stretch upon which to play, outside.

Christoph

1. There are no signs of personal identification.
2. Three colours have been used for this drawing, the house is dark, and the windows are light.
3. The house stands on its own with no context.
4. The chimneys have been drawn with the most detail.
5. The green doors are brighter than in reality, the windows dark, and the frames structured into panes of glass.

Analysis: Christoph uses lined paper, which emphasises the linearity of his drawing. His house is precisely drawn, but faceless, giving away no clue as to its context or its inhabitants. He portrays a fixed exterior, with no indication as to the passing events or circumstances occurring within it, a gesture of privacy.

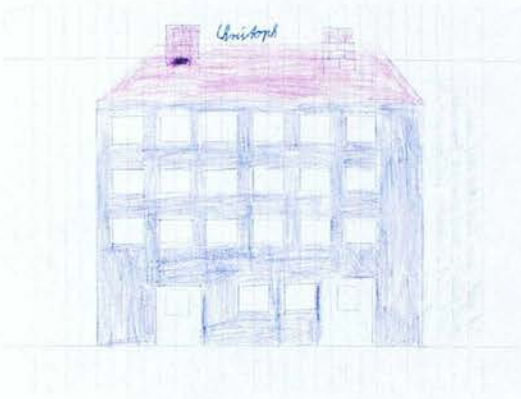

FIGURE 47 CHRISTOPH'S HOME

FIGURE 48 SIMON'S HOME

Simon

1. Simon leans out of one of the windows of the house he drew. His is the only house with people at the window.
2. Using the colour orange, Simon highlights his house in comparison to the drab grey and purple of the other houses. He uses nine colours to describe his environment.
3. Dividing his page into four, he drew a fish-eye perspective of his bedroom, highly detailed and filled with objects belonging to him. In another triangle, he drew his house In the third space he drew the area of his neighbourhood where he likes to go to. The fourth is reserved for the title.
4. Detail is evident in the contents of Simon's room, in the colour patterns on the buildings, faces and observations of the street sand fence structures.
5. Colours are exaggerated, but otherwise the pictures are very accurate.

Analysis: Simon chose to represent his neighbourhood according to one of the presentation boards, which the children were shown to introduce them to the project. This indicates his special pride and sense of ownership in his home.

First Conclusions

Various themes can be extracted from this quick glimpse at the children's neighbourhoods.

- The children are primarily concerned with the problem of identification and legibility in this environment: how do I express which is *my* house? Universal use of house

numbers has been used as an important means of place identification in this environment of architectural sameness. All the children knew and often showed the adjacent house numbers, and knew whether the numbers were even or uneven.

- Using house numbers, small variations in the architectural detail, through direct labelling, or more subtle techniques such as putting people at the windows, 'hanging' differently coloured curtains, or emphasising the house by using a brighter colour than that of its neighbours, the children have sought to address the question of sameness and problems of personal identification.
- It is interesting to note how important it is for these children to define where they live, and establish a sense of 'rootedness' with their home. Those cases where the children exaggerated the colour of buildings indicate their apparent longing to make their own home special, a place with which they can identify themselves.
- People, animals and plants - all indicators of life, energy and activity were a rarity on the drawings. If people were shown, they were predominantly shown *inside* the building, not around it. The children tended to portray their homes, (even the single-standing houses) as monoliths, commanding the space about them.
- Few children saw their environment as a combination of internal and external experiences. For them, their home was definitely separate from the environment in which it stood.
- A particular ability repeatedly shown by the children was their ability to concentrate on some fascinating detail, enabling them to diminish the negative effect of the whole. This was obvious in the care given to Lydia's car renderings, or of Nicole's exquisite window treatments. This was evident as a preoccupation with describing a different and better kind of reality than was actually present in the physical fabric.
- Roads appeared often as an element of separation.

Week three: Choosing Places and Important Things

Case Study 1 Walther Rathenau School

Below is the list of places chosen by the children to be their favourite destinations. They are shown marked as red dots on the map:

TABLE C CHOSEN PLACES WALTER RATHENAU SCHOOL

Chosen Places
The School Playground
At Buchenwald Platz
An abandoned house adjacent to the school
At the train station
Basti's Garden
Eugenie's Garden

The school garden
The Playhouse
At Rosenthal Str. 7
Weimarhallen Park
Old Treehouse
Grandma's Garden
At Patrick's House

Case Study 2 Lucas Cranach School

The children of the Lucas Cranach School chose the following places:

TABLE D CHOSEN PLACES LUCAS CRANACH SCHOOL

Chosen Places
1. Kindergarten Playground
2. The New Playground
3. The Football Field
4. Lydia's Meadow
5.The Neglected Playground
6. The Timber Playground
7. The Youthclub
8. The Russian Puddle
9. Disabled School Playground

10.SmallChildren's/Baby playground
11.The Russian Mountain and The Treehouse
12. Russian Officers' House and Turnhalle
13. The Elephant Playground
14. Rödchen Weg Playground
15. The Junk Yard / Tree-house
16. The Green House
17.MyMeadow

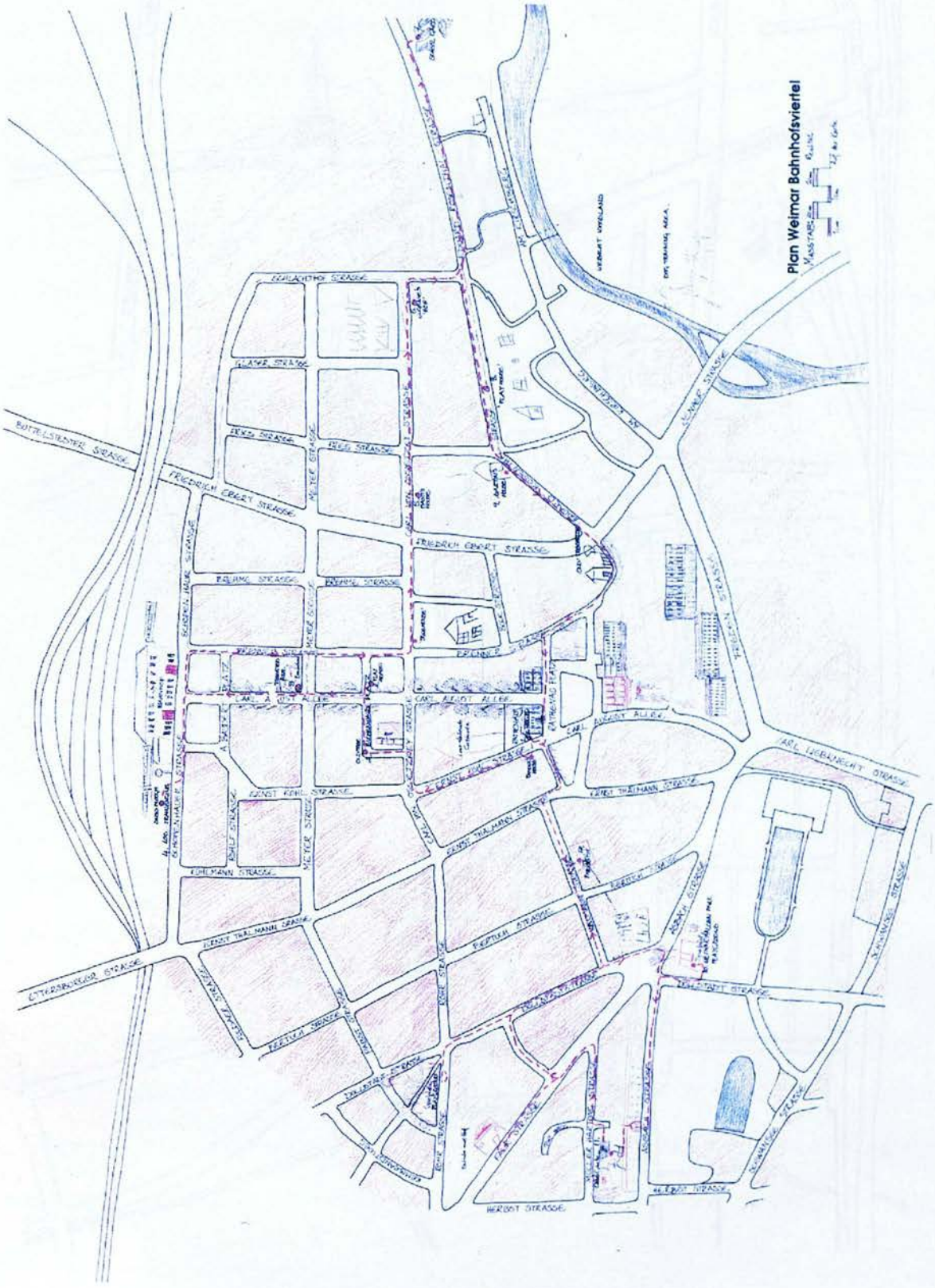

FIGURE 49 MAP OF THE WALTHER RATHENAU NEIGHBOURHOOD DISTRICT

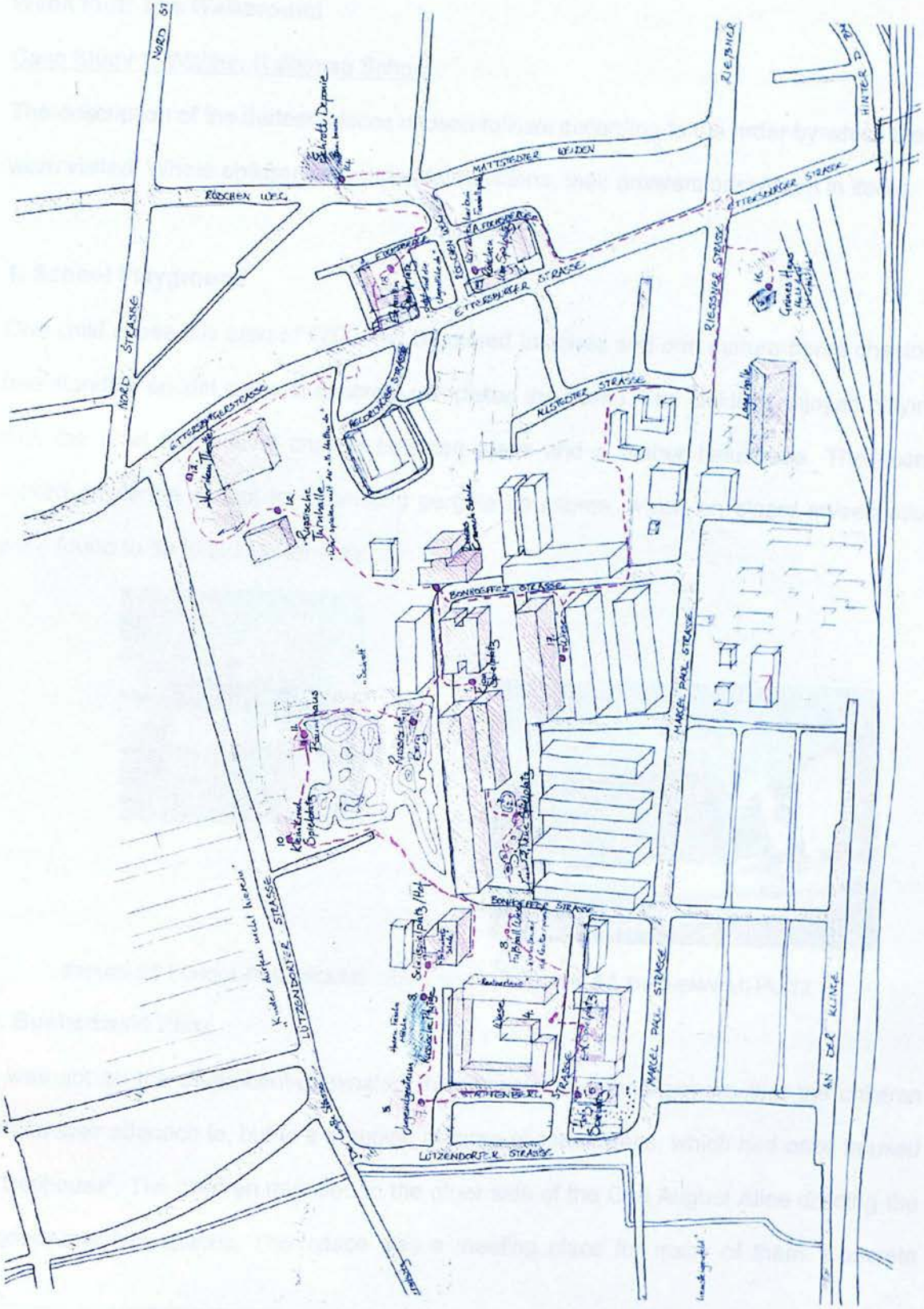

FIGURE 50 LUCAS CRANACH SCHOOL NEIGHBOURHOOD MAP

Week four: The Walkaround

Case Study 1: Walther Rathenau School

The description of the thirteen places chosen follows according to the order by which they were visited. Where children responded to questions, their answers are written in *italics*.

1. School Playground

One child chose this area of 1000 m2. Scattered benches and one mature horse chestnut tree standing amidst a sea of concrete completed the scene. The children enjoyed playing with the level 50cm level change between steps and a timber balustrade. The scene lacked challenge except for promising pergola structures, which on closer investigation were found to be forbidden territory.

FIGURE 51 SCHOOL PLAYGROUND

FIGURE 52 BUCHENWALD PLATZ

2. Buchenwald Platz

It was not on the monument-dominated Buchenwald [1]memorial square that the children turned their attention to, but to a grouping of three chestnut trees, which had once housed a treehouse[2]. The children migrated to the other side of the Carl August Allee dividing the square into two spaces. This space was a meeting place for many of them. Concrete

[1] Buchenwald was the Nazi German concentration camp outside Weimar. This square was designed by the soviets during their occupation of East Germany, as a memorial to those who died and suffered there.
[2] This had been built by older children in the neighbourhood, and had recently been dismantled during the renovation of the square.

sewage pipe sections lying on the grass and awaiting burial in the street drew the children's attention. One pipe section was comically filled with unwanted stuffed toys- the children's curiosity was aroused, and this time, the children fired questions. *What is it doing here? Can we take them* (the toys) *with us? What is the pipe for?* The loudness of the intervening traffic and the poor visibility due to dense parked cars forced us to the next site.

FIGURE **53** AN ABANDONED HOUSE

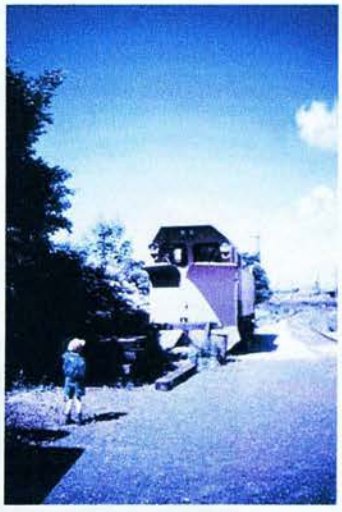

FIGURE **54** AT THE TRAIN STATION

3. An Abandoned House adjacent to the school

Three boys chose this place which was known to almost all of the children. A deserted town house and garden wilderness were home to a decrepit tree house broken glass, old television sets, rubbish and weed growth. Tucked into the lowest corner of the garden and accessible over a broken fence, the junk heap and treehouse were immediately pounced upon by several of the boys and girls. Some of the girls expressed dislike, *that is 'environmental pollution'*, and sensed the danger of glass shards. The boys generally disregarded the rubbish. One boy picked up a loose roofing slate as a trophy to take home. *I find it great here.*

4. At the Train Station

The group by-passed a grassed space, planted with two single lines of lime trees to arrive at the 'abandoned' engine. The snowplough motor was sometimes required in deep winter, but this did not deter the children from playing on and around this object for hours, making up train-driving scenarios. Officially out-of-bounds, the children deemed this corner of the property of the German railways 'intrudable'. None of the children had yet been told off for playing here. One of the girls commented that, *If I were allowed to wear old clothes and get dirty, I would come here and play*. Some called the engine *dangerous* and *dirty*.

FIGURE 55 BASTI'S GARDEN

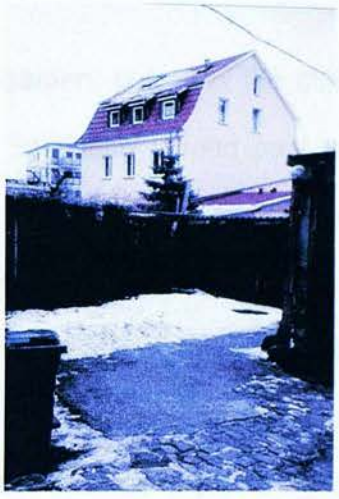

FIGURE 56 EUGENIE'S GARDEN

5. Basti's Garden

On the way to the backyard of one child, the group passed an abandoned infill building site. The site enclosed by houses possessed large quantities of building spoil, crushed rocks and gravel. The site was unknown by the majority of the children and it became hard to tear them away.

The backyard itself was enclosed on three sides by the walls of other houses and on the fourth by a large wooden gate. Paved and plant-free the grey yard held little attraction other than its proximity to the house. No one felt inclined to stay in this space of 60 m2.

6. Eugenie's Garden

Eugenie showed us proudly around her garden, of 100m2. Eugenie's friends immediately began to swing on the swing, hung from a branch of the single tree in the space. Other than a small lean-to, this was the only feature in this little enclosed environment. Eugenie explained that her father *refused to let her out of the yard on my (*her*) own*, although her *friends were always welcome*. Several of the girls chorused in that they too were expected to play in their yards - for safety's sake.

7. The School Garden

Only two children had chosen to visit this garden, but all of the children wanted to stay longer. On entering the gate, the children cautiously wound past geometrically laid out vegetable and flowerbeds. Having reached the small summerhouse (a third of the way in), the children broke free and ran wildly down the slight slope to the end of the garden, collapsing in heaps on the ground. Beneath the willow arbour, between the few old fruit trees (which share the property boundary with a metal chain-link fence) and scattered about the bulb-strewn mossy lawn, the children felt free to pick a fight, pick flowers, or 'set up house'. The children are expected to work the soil, remove weeds and plant when they come to the school garden. This time, free of expectation, many of the children commented that the place was *not so bad after all*.

FIGURE 57 SCHOOL GARDEN

FIGURE 58 THE PLAYHOUSE

8. The Playhouse

As time was short, only the briefest of visits was made to the grounds of this house designated to provide after-school activities for children. The boys valued it for the small football field, the girls preferred the indoor activities or basketball and roller-skate space. As many children of working parents found themselves unsupervised after school, the Kinderhaus was a much-visited attraction.

The house was set up during the communist era as part of the 'Pioneer' projects for youth. The centre was designed to cater to school age children for the time when they were not in school. The building required renovation, the decrease in financial support from the council necessitated the choice between losing the building, or developing a viable centre for children's 'freetime'.[3]

9. At Rosenthal Strasse 7

Everyone did not know this private garden, but all the children visibly enjoyed their short stay. Enclosed from the street by a series of extensions to the living house, and fenced on both sides by neighbours, the space created was narrow and long. This shaft of space was home to a generous chicken pen, fruit trees, vegetables and flowers laid out with geometric precision, small lawns and a swing. The children had to be torn away from their chicken -catching, tree and fence climbing, path walking and swinging.

FIGURE 59 AT ROSENTHALER STRASSE 7

FIGURE 60 WEIMARHALLEN PARK

[3] Karen Wirsching, who teaches at the Playhouse kindly, furnished the information.

10. Weimarhallen Park Playground

The playground is officially an area of 500 m2. This is an area enclosed on two sides by a newly reconstructed two-metre high rough limestone wall, against which a few fledgling bushes struggle. A third side is defined by the bitumen path, which begins at a gate in the wall and runs the full length of the 4.5-hectare park.

Beyond this path is an additional area of questionable definition. A suspended 1m wide strip of rubber has been placed there for children to run and jump on. Next to this are the abandoned concrete foundations of two benches and a disused concrete sandpit. The whole is contained within yet another pathway and overshadowed by a group of six pine trees. The fourth side gives on to small mixed woodland, which the children have integrated into the playground.

FIGURE 61 WEIMARHALLEN PARK

The area designated as playground, and that actually used by the children differed greatly in size. A close network of small trample paths cuts through the small adjacent woodland area circa 1000 m2. Between bushes, trees and paths, the children laid claim to two small clearings (one situated between two electricity converter station buildings, where high voltage insulated wires spanned the gap)...

Here children paid attention to the questions asked of them:

What do you do here? *Play*

Do you come here often? *Yes, after school we meet up with our friends.*

What don't you like about this place? *It is sometimes dirty and we find glass.*

The children were encouraged to use the playground as they ordinarily would. The children divided their attention between the semi-decrepit slide, two swings, and running through the myriad of small paths.

11. Grandma's Garden

For most of the children this was unmarked territory, those who knew it were girls. In response to " What do you do here?", the girls replied that they *pretend to look after ponies, pick flowers and sometimes help Grandma in her garden.*

The place was a large, sheltered courtyard on a shallow south-facing slope, surrounded by largely un-renovated turn-of-the-century social housing blocks. The few trees in the garden were fruit-bearing, but rarely used for climbing, and one strip of land, formerly a driveway was favoured for ball playing - a theme picked up on by the visiting boys of the class. The girls who knew the place immediately sat down and began picking buttercups.

FIGURE 62 GRANDMA'S GARDEN

FIGURE 63 PATRICK'S YARD

12. Patrick's Yard

This concrete paver-covered yard of 400m2 , interspersed with two trees, functioned as a car park for Patrick's fathers' firm. The children were loathe to pause in the space, but at the offer of a guided tour through the small factory (a plumbing business), the boys, and

subsequently the girls, filed through the narrow aisles of stored inventory, eager to have been considered important.

Case Study Two: Lucas Cranach School

1. The Kindergarten Playground

The children flitted quickly by, finding this chosen place too spartan and lifeless. Other than a small carrousel and climbing frame, this little sand oasis sits without obvious shelter in a sea of concrete. *Nothing to do here.*

FIGURE 64 THE KINDERGARTEN PLAYGROUND

FIGURE 65 THE NEW PLAYGROUND

2. The New Playground

Several children listed this as their *favourite place*. A 'hill-slide', multiple tyre swing, carrousel, swinging chains and an assembly of benches and low wooden fences, are placed about an elongated elevated site, suffering from wind exposure. Although less than one year old, many of the items suffered from 'inappropriate' use or neglect.

The children became instantly active on arriving, scattering themselves among the many attractions and switched from one piece of equipment to the next with rapidity. The immaturity of the vegetation prevented it from providing any shelter, and the few high stemmed trees were ignored among the other attractions.

The children were most critical despite the newness of the playground: *It's not the best playground, Too much stone, and too little grass, The lawn is too small for football, The things are too far apart.* The children explained how the place was used as a central *meeting place* - to then go on from for other activities.

3. The Football Field

Actually, as the children were quick to point out, this was not a football ground. The game was barely tolerated by the inhabitants of the overlooking building; an eight-storey block, home to many elderly singles - the "pensioner house". The children told creepy stories of elderly observers shouting at them to reduce their noise, and sinister encounters with passing residents. One girl was convinced that these residents would catch children playing there.

The large open space gently sloping to the south was indeed football pitch sized, and the shortly kept grass made it an ideal playing surface, despite the lack of markings and goal posts.

FIGURE 66 THE FOOTBALL FIELD

FIGURE 67 LYDIA'S MEADOW

4. Lydia's Meadow

Tucked away behind the *pensioner's house* was Lydia's chosen place. A sheltered grass lawn, exposed to afternoon sun and with an incline of 4%, this space was used by some of the girls to meet and talk in. After a brief pause sitting on the grass, the group moved on, without further comment.

5. The Neglected Playground

Diagonally across the street lay a small (500 m2) neglected playground. Uneven paving slabs on the pathways, tall-growing weeds, and peeling paint on the two quaint climbing frames belied a sense of neglect. The children seemed oblivious to this, feeling comfortable to spread out within this sheltered space. One child lived in an adjacent

apartment block, and others knew the place. Many children said they played here because *it is near to where our grandparents live*. The children tended to ignore the outdated play equipment and focused on their own created games. Promise of the next stopping point was sufficient to gather all the children to proceed on the tour.

FIGURE 68 THE NEGLECTED PLAYGROUND

FIGURE 69 THE TIMBER PLAYGROUND

6. The Timber Playground

The children arrived at the playground of three wooden towers, set on the edge of the housing estate, commanding views into the surrounding farmland. The children invigorated themselves by exploring the towers and running from one to the other. Although the playground consisted of more parts, the children seemed stuck at the 'main attraction'. On asking the children what they like to do here, they showed the kick-about area, used for *football and rollerblades*. They stressed that the area was however inadequate *for proper play*, and that *teenagers had broken the fence*.

All of the children knew the place, although the playground was for some two kilometres from home. The children said they *felt safe there*, knowing it had *been planned just for them*, even though the surrounding streets were little frequented by pedestrians. The surrounding vegetation received no comment. One child was distressed on *finding really terrible markings* drawn on the inside of one of the timber towers; the sign was a right-extremist swastika.

FIGURE 70 THE TIMBER PLAYGROUND

FIGURE 71 THE YOUTHCLUB

7. The Youthclub

A concreted area, a basketball net, a table and benches characterised this small area. The children said that they *came here to meet up with each other, play basketball, and hang around while waiting* for activities inside to begin. Here they would *watch films*, engage in some crafts and *come for discos.*

8. The Russian Puddle

A legacy from communist days, this low-lying area had been dubbed as the Russian puddle. On the outskirts of the estate, not subject to passing adults, the children would come here to experience the water after heavy rainfall, and the occupying frogs. The children told of the rabbits, foxes, birds and newts they had observed. Just 100 metres to the north behind high walls and barbed wire were the main Russian soldier barracks for the town of Weimar. For the children, this area simply did not exist, even seven years after the collapse of the Soviet regime it was *out of bounds*. The area was chosen by a girl as it was *near to my (*her) *grandmother's house*.

FIGURE 72 THE RUSSIAN PUDDLE

FIGURE 73 THE DISABLED PLAYGROUND

9. Disabled School Playground

Those children who knew or were related to someone attending this school felt comfortable playing in the newly equipped playground. The others simply referred to it as the *disabled school*, teasing one of the boys because his cousin went there. It was generally decided not to enter the playground, but to skirt around it on the way to the next location.

10. Small Children's/Baby playground

Situated at the end of an apartment block, and away from the traffic of the rest of the estate, this place had been dubbed the *baby's playground*. Although new, the equipment was somewhat spurned (a sandpit, swing and small climbing frame). Some of the less outgoing children found their sanctuary here, and began using the equipment in a familiar manner. The boys, sensing what was next, were eager to tear away.

FIGURE 74 SMALL CHILDREN'S/BABY'S PLAYGROUND

11. The Russian Mountain and The Treehouse

Several children chose this area - a series of small man-made hills created from the dumped material, excavated from the foundation pits of the estate housing blocks. Small paths had been wound into the vegetation, and the area presented a labyrinthine quality to the uninitiated. Hiding among remaining orchard trees and the secondary regenerative growth of vegetation dominating the area, wound a narrow, stone-lined path to a self-built treehouse. The children explained *that other, older children and their fathers had created the treehouse*, but that they now used it. The children were eager to enter their house and commence games, but somewhat reluctant to show me all the details. The author

registered a mixture of pride and insecurity in their expressions, as though not certain whether their creation was 'legitimate' or not.

FIGURE 75THE RUSSIAN MOUNTAIN

FIGURE 76 THE TREE-HOUSE

12. Russian Officers' House

What was once a pleasure house for Russian officers has now become an occasional theatre and a ruin. The children said they *like to come here when it snows* - to sled down the slopes bordering the car park. On the expanses of concrete in-between the various buildings, they *play football*, and decrepit roofs lend themselves to climbing. Across the chained doorway of the old gymnasium, hangs a sign reading, "Parents are responsible for their children".

FIGURE 77RUSSIAN OFFICER'S HOUSE

FIGURE 78 TURNHALLE (RUSSIAN OFFICER'S HOUSE)

The building swims in shattered glass, torn steel bars sway dangerously, and everywhere grow nettles and other secondary-growth vegetation. The area was unfenced, unmanaged, and *known by every child.*

13. The Elephant Playground

Three-storey housing and some mature shrubs and trees surrounded the area of 500 m2. The play equipment; an elephant climbing frame, carrousel and slide were placed within a circle of sand. No further structures were provided and there was no obvious spatial relationship between the objects. The children played on the equipment for a while. When asked if they ever climb the trees (which lend themselves to that activity), the children replied that *the climbing frames were better.* Situated approximately ten minutes walk from most of the children's homes, the boys *often came here to play football.*

14. Rödchen Weg Playground

Two minutes walk from 'the Elephant' was another playground. The children's initial reaction was negative, *Nothing here, No equipment, Yucky, Empty, We're not allowed to play football here.* The children offered to pose for a group photo and then moved on. The teacher later revealed that the children had problems with the residents, due to noise levels during play. Children had been *told off for running through* washing hung out to dry.

FIGURE 79 ELEPHANT PLAYGROUND

FIGURE 80 RÖDCHENWEG PLAYGROUND

15. The Junk Yard

One boy chose the junkyard, saying it was *full of interesting things*, and that there were *always trucks driving in and out*. The children could see little more than the closed gateway, and so turned away. On the way to the next stop, three boys showed the group a small corner beneath a bush, filled with odd bits of junk. The boys had taken it over and had begun to tidy it up as their *tree house*.

FIGURE 81 JUNK-YARD

FIGURE 82 'TREE-HOUSE'

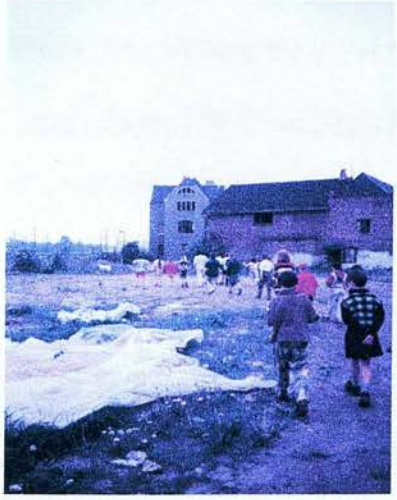

FIGURE 83 THE GREEN-HOUSE A.

FIGURE 84 THE GREEN HOUSE B.

16. The Green House

Winding around houses, we came out into the wasteland that stretched before an abandoned villa. The children came within twenty metres of the building and observed the smashed windows, open fireplace, litter, and burned-out interior. When asked how they felt, the children responded: *It's scary, they do drugs there, there are strange noises.*

The teacher was anxious to take the children away, but here, more than anywhere else, it was hard to round them up.

FIGURE 85 MY MEADOW

17. My Meadow

The last place to be visited was a rather forlorn expanse of lawn sandwiched between two, eight storey housing blocks. The space, 15x40 metres long had only two washing lines stands to enrich it. The children turned their heads towards the area, looked, *said there's not much there* and went on, back to their school.

Week five: Voting for a Favourite Place

Case Study 1: Walther Rathenau School

The voting figures are shown below, on the day only twenty-one children were present.

TABLE E VOTING FOR A FAVOURITE PLACE WALTER RATHENAU SCHOOL

No.	Chosen Place
0	The School Playground
0	At Buchenwald Platz
0	An abandoned house adjacent to the school
0	At the train station
0	Basti's Garden
3	Eugenie's Garden
0	The school garden
3	The Playhouse
0	At Rosenthal Str. 7
8	Weimarhallen Park
5	Grandma's Garden
0	At Patrick's House

Only nineteen children voted. Two children refused to vote; these were children who lived beyond the defined neighbourhood area. The other children were ill. The Weimarhallen Park Playground won the vote, but the result showed no strong majority. For the fairness of the children it may have been good to make a second vote, between the two leaders, or to ask the children to have cast two votes each. This was not carried out for lack of time. The two categories for which the children decided; playground and garden are good indicators of the general preference of the group.

Case Study 2: Lucas Cranach School

The following is a list of the votes cast by the Lucas Cranach children. Twenty-five of the class of twenty-six children was present:

TABLE F VOTING FOR A FAVOURITE PLACE LUCAS CRANACH SCHOOL

	Chosen Places
0	1. Kindergarten Playground
0	2. The New Playground
0	3. The Football Field
0	4. Lydia's Meadow
0	5.The Neglected Playground
16	6. The Timber Playground
0	7. The Youthclub
0	8. The Russian Puddle
0	9. Disabled SchoolPlayground
1	10.SmallChildren's/Baby playground
0	11.The Russian Mountain and The Treehouse
	12. Russian Officers' House and Turnhalle
1	13. The Elephant Playground
2	14. Rödchen Weg Playground
0	15. The Junk Yard / Tree-house
5	16. The Green House
0	17.MyMeadow

The overwhelming majority vote went to the Timber Playground.

The playgrounds were the favourites among these children, with a hard-core faction plumping for the danger and mystery of the Green House. The playgrounds were almost always associated with safety; play could occur without fear of reprobation. The children were highly sensitive to the expectations of the adults, playing where they were supposed to. The Green House choice is in direct contrast. The four boys and one girl came from the group, which the teacher had labelled, 'difficult' children. They were rebelling against the call to compliance.

Week six: Drawing on improvements

The drawings made by the children of their plans for improvement to their chosen place are pictured below. The author presents the analytical descriptions of the pictures based on a reading from left to right across the page. The analysis is presented in note form:

Case Study 1: Walther Rathenau School

The following illustrates the composition of the groups, A to F :

Group A: Three girls and one boy

Group B: Three boys

Group C: Three boys

Group D: Four girls

Group E: Two boys, two girls

Group F: Two boys

Group A

Play equipment sprinkled across the paper. Children copy the spatial distribution known to them– scattered elements, even distribution, a result of insurance-dictated safety distances between equipment.

Tree house and bush, water and clouds, are drawn in close proximity. Clouds surrounding sandpit accentuate sense of floating and placelessness. A pollarded tree with bird: tree is

subject to strong maintenance, but still able to support natural life. Swimming pond populated with fish – apparently no discomfort with such close proximity to animals. Written comment: *no climbing trees*, accompanied by illustrations of climbing trees.

Group B

Existing play structure integrated into large, stone-built fort. Child acknowledges what is there, but suggests how it could be better. Space for role-playing: rifles, hats, and cigarettes suggest a signal of independence to the adult world.

Tree integrated into the play structure: tree-trunk supports the tree house, archway over tree, contains it within the structure, tower higher than tree, tree-trunk and tower in the water.

A balance between nature and man: the living tree is as worthy a part of the structure as the constructed elements. The tree's central placement suggests admiration for it. The slides and tree are connected together – expanding traditional use of play equipment and creating strong spatial definition. The emphasis lies in connection rather than separation.

Group C

Huge, overpowering weather patterns – rainbow, sun,

rain, which contain a littered field and a slide covered in graffiti... Nature can reconcile such litter and abuse of environment. Tiny rendition of existing play structure and representative flower. Sign reading *please don't write* projecting above rainbow, an indication of the importance given to the establishment of order in the playground.

Group D

Wind, rain, and lightning bear down from the sky. The tree is placed centrally and the rabbit lives in the secure pen, an ordered world. Rabbit cages have 'upstairs windows' and the anthropoid rabbits are standing.

The tree is presented as an ecosystem: animals, seeds, fungi and living, vital branches.

The tree is embedded in its surroundings, not rising up out of them. Two sides to the tree – wild side: squirrel and nest, hedgehog, fruiting bush, flower.

FIGURE 86 GROUP A DRAWING ON IMPROVEMENTS

FIGURE 87 GROUP B DRAWING ON IMPROVEMENTS

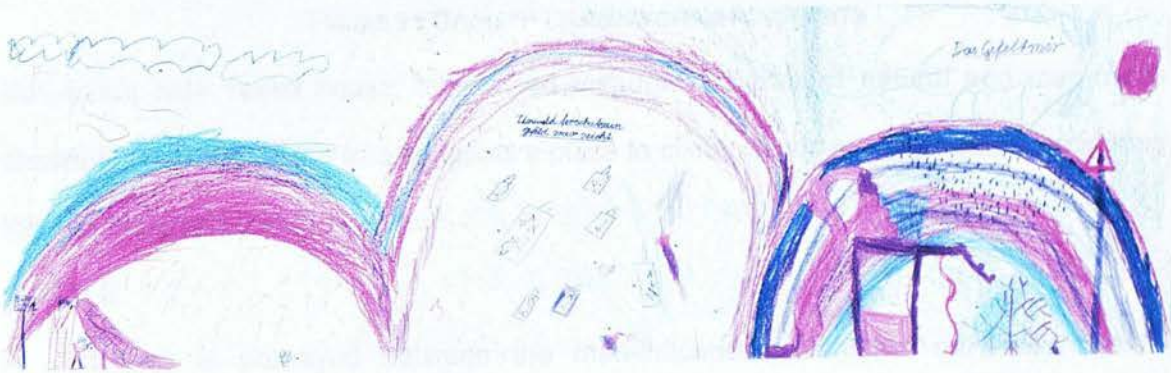

FIGURE 88 GROUP C DRAWING ON IMPROVEMENTS

FIGURE 89 GROUP D DRAWING ON IMPROVEMENTS

FIGURE 90 GROUP E

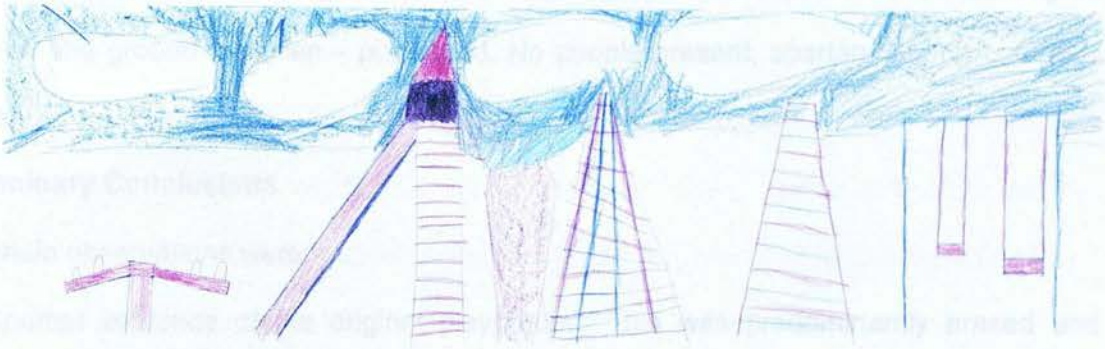

FIGURE 91 GROUP F DRAWING ON IMPROVEMENTS

Man-made side: rabbit house, maintained meadow. Balance of natural and man-made elements. The form of the tree suggests a place to climb; a ladder is provided. Dominating this natural environment is the sun.

Group E

A dichotomy is portrayed between the man-influenced elements on their 'island'– domestic pet, human, pavilion, and the natural – sky, water, earth, and plants, which surround them.

The narrow strip of paper is filled with rich composition. Balance of man-made: fence, house, table, flagstones, ploughed field, with the natural: grassed meadow, tree, hedge, beaten earth. The house is emphasised with clear black lines, which are also used to differentiate between earth, fence and lawn thus supporting the clear spatial structure.

Sky and Pond appear united: both are populated, (birds and fish) and both share the same colour. The juxtapositions continue: large deciduous tree and small conifer, sun and

rainbow, plants and 'wild' rabbit. The tree drawing shows careful observation of the structure of plants. The rainbow unites the elements of the picture, the fence separates.

Group F

Hard to tell where one child's work ends; three drawing types are combined into a whole composition. Sky and earth are separated: the blue sky ends in mid-air. Simultaneously, towers and tree link sky to earth. The two strips of sky and earth serve to connect the isolated play structures. The tree is portrayed solidly, and centrally, the towers are filigree in form. The ground is barren – pure sand. No people present, spartan. Strong contrasts present.

Preliminary Conclusions

The main observations were:

- Spartan evidence of the original playground. This was predominantly erased and replaced with new elements an attitude in evidence in the general culture of post DDR Germany. Some children decided to acknowledge what they liked, and incorporate this into their own schemes (Group B).
- Varied degrees of empowerment were projected through the drawings. Group C, the 'rainbow specialists', chose to illustrate their emotional dissatisfaction using the symbol of empty beer cans and the huge presence of the rainbow. It showed a nice play of balance between open critique of their environment, and the capacity for hope and forgiveness of these 'sins'.
- Generally the children showed a tendency to integrate and compensate. Often their drawings represented juxtaposing worlds of man-made and natural (A and E), but these were not seen to be 'at odds' with each other, rather, they were presented in the form of a balance, between the influence of the natural world and that of the man-made. Even in cases where the children portrayed separation between, for example sky and earth (F), they sought forms to compensate this separation.

- The difference in scale used between climatic aspects and man-made constructions suggest the child's 'all-powerful' view of the natural environment. The tiny flower and minute play-equipment of Group C suggests awe for nature, which puts the human being into the role of an ant. Sub-consciously, the children reveal their personal cosmology through what they have drawn.
- Additionally, several of the girls expressed their need for security (D): this was expressed in the illustration of the stormy figure of the wind showering rain and lightning onto a little rabbit. The rabbit hutches possessed strong barriers. Furnished with happy rabbits, and quantities of food, the hutches appeared like a microcosm of the playground, which these girls wished for themselves. These girls confided that they would gladly discover secret corners of their neighbourhood, but were filled with cautionary tales from their parents of kidnapping and child molesting.
- The predominantly constructive mood of these children was hard to ignore. Instead of losing themselves in apathy and despair, the children freely drew their image of a better version.

Case Study 2: Lucas Cranach School

The children were put into groups. Most of the children decided however to split their paper and draw as individuals.

1.

Laura and Lydia proudly presented their amusement park spread without context across the page, in bright felt-tip colours. The ideas were adapted from experiences at Mc Donalds, Burger Kings and shopping centres. Coloured swinging tyres padded plastic ball-filled area to swing into, a playhouse built out of building blocks, and a serpentine slide accessed by a ball-filled funnel. The colours are definite; these drawings do not betray signs of hesitation and descriptions are concise: *That is a tower with a slide. The slide is a tube, in the tube are, rollers.* The picture is lively and creative, without natural

elements or means for the children to alter the experience except for the way in which they physically use the equipment.

FIGURE 92 LAURA AND LYDIA 1.

FIGURE 93 EVA AND JESSICA 2.

2.

Eva and Jessica's inspired climbing net, and carefully designed tower construction warrant explanation: The form of the net is irregular, perhaps influenced by a reluctance to draw overlapping forms, the task being too strenuous.

The tower is formed from large coloured blocks, connected by secret passages. Balls and children can roll through the tower. There is only one entrance, and one exit, requiring a discipline of use on the part of the exploring child.

3. . See 5.

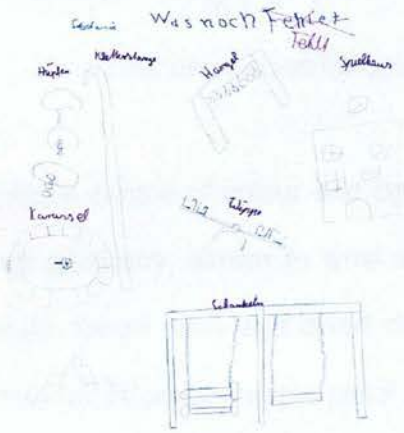

FIGURE 94 STEPHANIE 3.

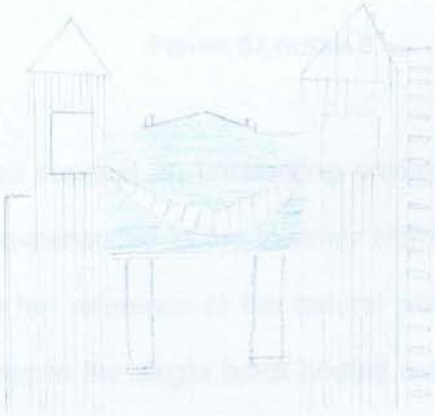

FIGURE 95 4.

4.

This child increased the height of wooden fort to accommodate two swings creating a secret passageway between the two towers. The drawing is symmetrical and looks like a face.

5.

Cornelia and Marlene's detailed drawing and central placement of a 'Wendy-house' lavatory, emphasise this symbol of domestic bliss and security. Absent parents, and large distances between the playground and the home make this an important issue. The small scale of the house forms a sharp contrast to the towering concrete blocks surrounding the playground. Stephanie's drawings show replicas of Cornelia and Marlene's.

FIGURE 96 CORNELIA AND MARLENE 5.

FIGURE 97 ALBINA 6.

6.

Albina's choice of colour and right-angled forms suggest an unrelenting environment of hard geometry, similar to what she has daily experienced in the Weimar Nord housing estate. Dwarf trees and dwarf clouds serve as her reference to the natural world. Their power of influence seems pitiful when, compared to the single black-bodied robot figure and the steel frame of the swing.

7.

Each element of Nicole's scientific drawing is carefully labelled with the description of the activity involved, *to hop on, to rock* etc. It reads like a shopping list of elements without a given priority. The picture conveys an aura of emotional detachment. This drawing seems lifeless, compared to her first, perhaps betraying her ambiguity to the project itself.

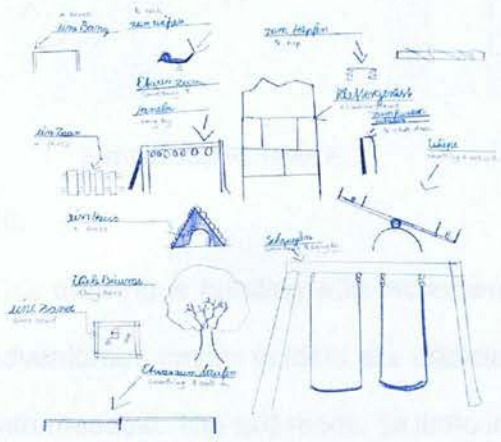

FIGURE 98 NICOLE 7.

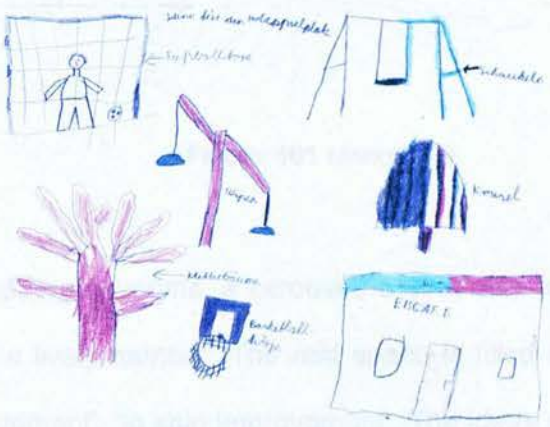

FIGURE 99 MARTIN 8.

8.

This time the wish list rendition is lively. The ice-cream parlour hints at a certain 'joi de vivre'; purchasing pleasurable summer ice cream, becomes a symbol of the child's growing independence from her parents. The artist himself stands as a happy footballer in his goal posts.

9.

This accurately constructed drawing shows only the towers and slide of the existing playground. The added swing serves to bring danger and excitement, although the drawing itself is most flat

FIGURE **100** FLORIAN 9.

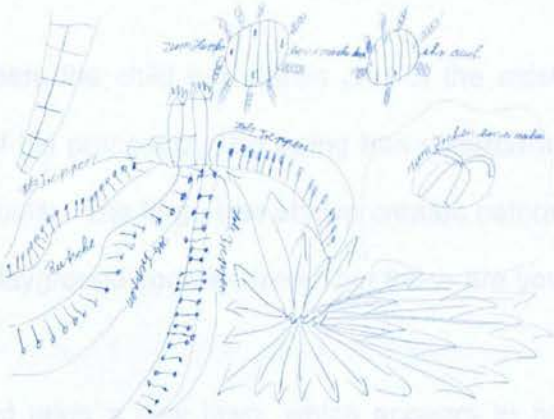

FIGURE **101** MANUEL 10.

10.

This drawing is bursting with movement; hopping elements, a carousel, a slide and four adventurous timber ladders are depicted in a lively manner. The rest space is filled out with meadow. The text reads, 'to jump improvement', 'to spin improvement'. The ideas are clear. Arrows indicate different areas, which give a tension and movement to his drawing. Manuel's labelling is integrated into the structure, so that the drawing is not interrupted with text.

11.

This slip of paper is the result of the group's decision to cut their paper into individual sections. The strip is as narrow and straight as the element drawn on it. This child appears intimidated by the task, using text to explain a weak drawing.

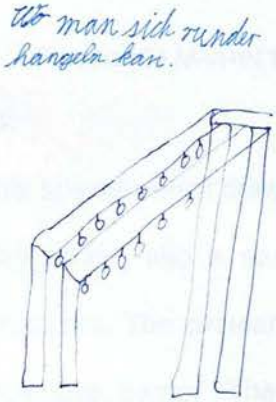

FIGURE **102** 11.

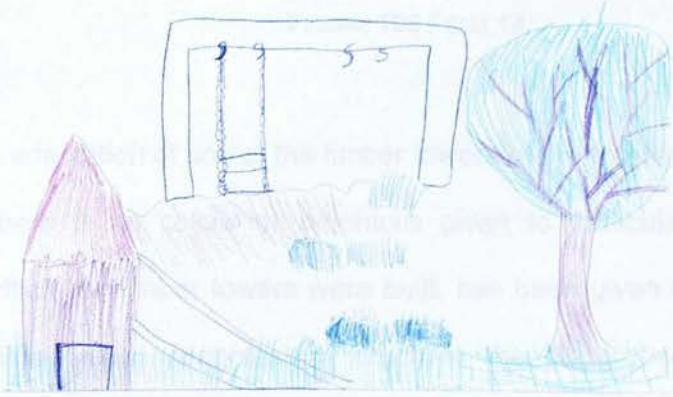

FIGURE **103** 12

12.

This is the first picture of Weimar Nord where the child has drawn *part* of the existing playground to give an idea of the context of his proposals. The swing has suffered from vandalism, and this even before it could be built... The large tree shown creates pathos in the viewer; mature trees require time. The playground contains trees, but these are young and spindly.

'Rocking forms' to bounce upon are spread upon a new lawn, which appears to have replaced the concrete paving of the original playground.

13.

Martin's picture has elements already pictured by his friends. The interesting feature is the carefully labelled, 'climbing tree'. This stands in a central position on the page; another irony becomes apparent the tree lacks branches, especially at climbing height...

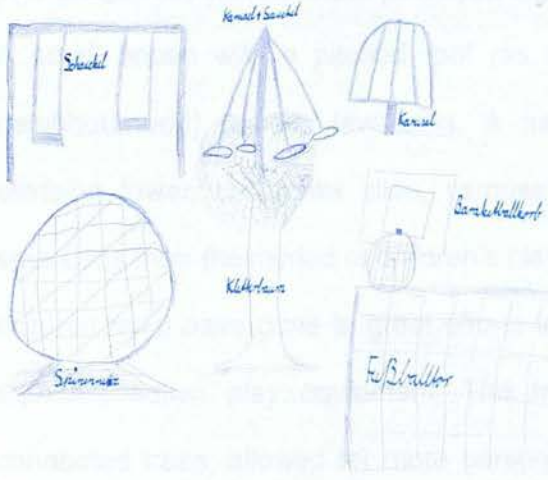

FIGURE 104 MARTIN 13.

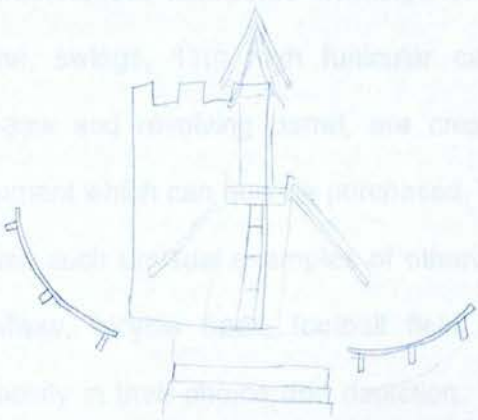

FIGURE 105 FELIX 14

14.

This sparse pencil drawing shows an adaptation of one of the timber towers of the existing playground, into a sturdy tower. There is no colour or emphasis given to particular structures. The circular sandpit, in which the timber towers were built, has been given a protective barrier. The fort is contained within a contextual structure, the playground drawn as a plan view.

15.

This group decided to work together, and kept the paper in one piece! One member of the group decided to draw his own proposals for the place where he lives (he recently moved out of Weimar Nord, to the Ettersberg Siedlung.), thinking better of it, he left the small box he had prepared in one corner, empty. These children openly discussed what they could visualise as improvements to the playground – the only group who did.

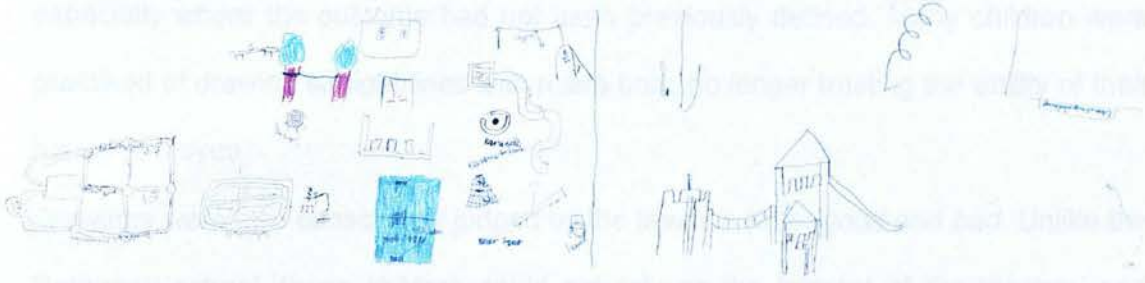

FIGURE 106 15.

The images are nevertheless portrayed with the minimum investment of effort.

A small house with a pitched roof (as a contrast to the flat-roofed buildings of the neighbourhood) houses lavatories. A trampoline, swings, 11m high funicular cable, climbing tower, corkscrew slide, carousel, see-saw and revolving barrel, are creative selections from the myriad of children's play equipment which can now be purchased. The children must have gone to great efforts to choose such unusual examples of otherwise standard action play equipment. The mini railway, bicycle track, football field and connected trees, allowed for more personal creativity in their choice and depiction. The football field is for children up to the age of 12, *'with fence'* and is split into two areas: soft grass, and hard tarmac, thus catering for varying activities. Such details as this and the labelling the height of the funicular cable show a high sensitivity to detail, to functioning and the manner in which the design of the environment can support the activities, which go on within it.

Preliminary Conclusions

This set of drawings provides a stark contrast to those of the Rathenau School.

- Visually, the quality of drawing is notably poorer. It is also more diagrammatic; the lack of aesthetic creativity is perhaps a pre-indication of the lack of creative thought, or the lack of enthusiasm for the project.
- It appeared that the children were not used to working in this independent manner, especially where the outcome had not been previously defined. Many children were practised at drawing straight lines with rulers only, no longer trusting the ability of their hands and eyes.
- Drawings were also consciously judged by the teacher, in to, *good* and *bad*. Unlike the Rathenau school, these children could not rely on the interest of the teacher, and whatever motivation they brought to the project had to come from their own, sometimes meagre source.
- The majority of the drawings read, like a shopping list of wishes, mostly wishing for play equipment, which the children had seen on other playgrounds. The equipment satisfies the immediate need for movement which all children have, but allows them little space for free play, for role-playing and particularly for creative construction - for a diversity of operative learning experiences. Group fifteen made great efforts to propose the most unusual play equipment they had seen or used, but only Lydia, Laura and Group 15 came up with any genuinely new equipment. These structures too were variations on the themes, which the girls had already experienced, suggesting that the diversity of the new elements were a reflection of the children's experience. This experience was modified by their perception and the propositions for the playground were the expressions of these perceptions.
- The children are preoccupied with immediate satisfaction: The ice cream kiosk (8) and copied models of fast food chain slides and entertainment centres illustrate this. A twisting slide can only be slid down – there is not even the flexibility to twist ones-self

from side to side – the entertainment product completes the task for the child, who simply has to sit down and relax...

- The copying revealed a poverty of imaginative ideas. The Rathenau children also, 'copied', but when three children draw a tree, three different species come into being. When three children draw a carousel, or a slide, there is some possibility for variation. When three children draw the *same* slide, the *same* carousel, then thoughts of dying or blocked creativity start to cross the mind...
- The child's almost brutal ability to reflect reality is shown vividly in drawing twelve. The swing, which was proposed, was designed to hold two 'swingers' side by side. The drawing shows one of these swings, next to this are the frayed tatters of a chain, apparently vandalised. The child does not shy away from honesty, but his quiet commentary of the possible future of any new addition to this playground shows an understanding that the adult world should be ashamed to confront.
- Another surprise from these drawings was the almost total absence of non-material life forms. The number of trees portrayed could be counted on one hand. Of these trees, many of them were barely recognisable as the powerful, beautiful elements they are. The tree drawn on picture thirteen was such an example. This is even more surprising when one analyses how much green space the children have access to. The '*Russian mountain'* for example has many old orchard trees, and would present to many minds the perfect play environment for children: fine structured, variety of scale, level changes, rich variety of vegetation, climbing trees, earth to dig in, sticks to play with..... The fact that the children did not choose the Russian mountain as their favourite, and that they could not draw a tree, (these children are on average one year older than their colleagues in the Rathenau School) indicates some other factor which seems to hold influence over the natural tendencies of the children. This appears to have its source in the cultural level.

The parents and teachers tended to view the *Russian Mountain* as a rubbish dump. It was *untidy, unpredictable, unhygienic, dangerous* and *boring.* The children had access to an environment, which would have fulfilled the wishes of the Walther Rathenau School children. What they did not have was the support from the socio-cultural sphere. The adult lack of acceptance might well have been a factor in deterring the children from using the area. The children had to combat the adult authority before being able to fulfil their wishes. It is hardly surprising that the children decided to escape to the *Green House* or the *scrap yard.* These places were equally forbidden but far enough away from the adult gaze.

Week seven: Idea Exchange

Case Study 1: Walter Rathenau School

The swapping of drawings for commentary followed the pattern: A with F, B with E, C with D. The written comments are listed below:

TABLE G IDEA EXCHANGE WALTER RATHENAU SCHOOL

Group F's commentary on Group A	
What we like	
Slide	Castle tower
Sun	Water slide
Climbing frame	Sand-pit
Flowers	Tree-house
Tall trees	
What we don't like	
Carousel	Clouds
Rainbow	

The Group F children omitted mention of the benches, ponds, the swing and the large bush. They found these element hard to relate to. Their own drawings had been of complete pictures, and here they were confronted by a list of floating objects. The omission of any comment regarding the ponds is curious, as their own drawing showed two bodies of water. It appears that these children reacted to the images they could understand, and left the other ones without comment. This remains however a puzzle and speaks of the gap in understanding between the world of the adult, and that of the child.

TABLE H IDEA EXCHANGE WALTER RATHENAU SCHOOL

Group E's commentary on Group B	
What we like	Tree-house
Tower	Slide
Tree	Flag
Fort	Staircase
Flowers	Pond
Grass	Sun
What we don't like	
The fence	Sign
Window	Sand
Door	Steps
The People	

The children agreed with most of the proposals. Where they experienced difficulty in agreement was in the details. The role-playing of the children dressed as soldiers disturbed this primarily female group. Other criticisms referred to points, which had not been drawn with care – the pale-coloured sand for example, the small sign, which had been twice crossed out, the dark, scribbled-on fence. Those children giving the critique had a well-developed aesthetic sense, and some of the hastily drawn, work simply appeared to offend their sensibilities.

TABLE I IDEA EXCHANGE WALTER RATHENAU SCHOOL

Group D's commentary on Group C	
What we like	
Rainbow	Flower
Slide	Tree-house
Grass	Sun

What we don't like	
Aerosol cans	
Beer	Rain
Glass splinters	Clouds
Wind	Rocket
Paper	Signs

These children not only studied the drawings with great care, but their powers of perception are more sensitive than many adults. The 'wind' of which these children complained, is only evident in the way that the raindrops have been drawn obliquely. The 'tree-house' is the name these children gave to a bush, planted in front of the modified existing play tower. The identification of the tiniest elements drawn, the shards of glass, aerosol can, a single lonely flower, etc. reveal much about the ability of these children to study a drawing with immense care.

What group D omitted to mention, the graffiti on the slide, the punks with green hair, and the warning signs, cannot be from a sense of carelessness. Perhaps these were not considered important enough to mention, or, like graffiti, so much a part of their every-day existence that the children have ceased to notice them as anything extraordinary.

TABLE J IDEA EXCHANGE WALTER RATHENAU SCHOOL

Group C's commentary on Group D	
What we like	Carrots
Rabbit	Hedgehog
Birds	Squirrel
Worm	Sun
Storm	Wind

Tree	Animal run
Rabbit hutch	Birds-nest
Small tree	Rain
Lightning	Book
Ladder	Flower
Meadow	Nuts

What we don't like	
Hole in tree	Door

Bracket mushrooms	Branches

One puzzling element identified by group A was the, *book*. Perhaps the children refer to the rabbit run, drawn so as to appear two-dimensional. The children saw a book, and the adult interpreter saw no such thing. This is an instance of the difference in the child's perception.

The only elements the children did not evaluate, were the flowers and the bushes. It appears that the trees made a greater impact on the children, as did the animals and the elements of the weather.

The *hole in the tree* and the bracket mushrooms disturbed the children, indicating signs of decay in this small paradise. For many children, decay and signs of ageing are something to avoid; their image of nature, perhaps formed by television programs cannot be associated with death or decay.

TABLE K IDEA EXCHANGE WALTER RATHENAU SCHOOL

Group B's commentary on Group E	
What we like	
Horse	Flowers at-the-fence
Fence, by-the-rainbow	Ducks
Fir tree at-the-fence	River
Large rainbow	Pond

What we don't like	
Dog	Person
Bench	House
Fish	Suns
Rabbit	Sky
Fence, at-the-house	

These children commented on what disturbed them, mostly in the aesthetic sense. The rabbit, for example has a strained expression on its face, and appears unnatural. The dog has a large head and neck, which, coupled with sharp teeth do not give the impression of friendliness or approachability. The child holding the lead, with pink skin, big black boots

and black eyes seems far from beautiful. The suns in the sky have been carelessly coloured over with blue, and the bench–drawer has not succeeded with his attempt at portraying perspective.

Group A's commentary of Group F

Data missing.

Case Study 2: Lucas Cranach School

Due to the necessity for working with a smaller group of children, the drawings were not swapped between groups. Critique and comments were made during a round-table discussion. During the discussion, the reduced group of fourteen children presented their drawings. Either the children or the author asked questions, if we required additional explanations. After the presentation, each child nominated one element from the many drawings, which they would like to see, built. The following list shows the result of a voting process to discover the popularity enjoyed by the new elements which the children had proposed:

TABLE L IDEA EXCHANGE LUCAS CRANACH SCHOOL

No.	New Elements Chosen
4	Bars to hang from
10	Basketball net
12	Blackboard
12	Climbing trees
10	Climbing tunnels
8	Coloured balls
7	Covered slide/ carpet slide
12	Funicular cable
10	Grassed football field + goalposts
12	Lavatories
12	Play-house/tent
12	See-saw

Those elements, which received ten or more votes, were constructed for the playground model.

The following questions were raised to stimulate some curiosity into the natural elements of the playground. *Have you thought about how the sun shines here, where the wind comes from, and how strong it is* (the site is wind exposed), *do you need a place which is shaded?*

What do you know about the animals, birds and plants living here? The children were mostly dumbstruck by these questions. One child ventured to say, *Perhaps we could learn about the birds by drawing them on the blackboard?*

An additional question was put to the children, *Could you find a way to attract the birds and insects to your chosen place*?

The response: *We could build birdhouses and put them among the trees.*

What followed was a discussion of the form and function of the chosen elements. Two elements were approached unconventionally; during a vivid discussion, the children finally began to release their creative potential for problem solving:

The Football Fence

The major problem identified by the children was the mis-use of the present hard-surfaced field by teen-agers. The fence was a particularly sore point. The children were upset at the many holes, which had been cut or ripped into the metal mesh. When asked why these holes were made, the children promptly answered that the teen-agers used the fence to climb on, sitting on the top of the fence for hours. When asked what the children could do about this problem, they proposed to strengthen the weak structure of the fence, to make it into a climbing frame for teen-agers, which still served the function of keeping stray footballs inside.

Rather than wanting to chase the teenagers away, the children generously expanded their own brief, to cater for the needs of the teenager population, whom, they acknowledged, had little or no provision for their needs in the estate.

The Blackboard

This second piece of innovative design produced a small sensation when presented to the town-planning department. The children had acknowledged the problem of free-running dogs and small children. Many of the girls stressed anxiously that the *smaller children* felt afraid to play in the sand because of dogs who regularly interrupted their work. The children proposed a fence structure, which would surround the central play area. Parallel to this many children recognised the need to provide benches or similar places to sit. They were additionally aware of the forbidding quality, which a fence can possess. With encouragement, the children proposed the blackboard solution. The fence would be a circular, double-sided blackboard. The playground would be regularly replenished with chalk and sponges for cleaning. After hefty debate, the children set the height of the fence, *high enough so that the dogs cannot jump over it*, and low enough so that the sloping coping on top of the blackboard could be used to sit on and to protect the drawings from the rain. The girls said that they would use the blackboard to teach each other to play the recorder – presumably they envisaged writing the musical notes on the board, to learn new songs.

Aside from the consensus required for such decision making, and the innovative quality of the idea, the children's concern for the 'smaller children' provided an interesting lesson in the way they viewed themselves, and the methods they used to express their wants.

On asking the same children later, if they were afraid of dogs, most of them answered with a, *yes*. Several of the children had younger brothers and sisters, and showed an interest in their well being. The fence proposal however seemed to mask an element of embarrassment of the children owning up to their fears. They projected their own needs and fears onto those of younger children, as a means of legitimizing their position. No doubt, they have constantly been told, *my dog never harms any one, don't be afraid*. The children could not openly admit their fear of dogs to an adult, for fear of repeated ridicule. Instead, they chose the next best possibility, by expressing a concern for the well being of

an external party, the *small children*. This has repercussions in the area of taking personal responsibility. If the children had been chastised in the past for expressing their own concerns, the solution was to champion the cause of an external party who held a more 'legitimized' right to complain. The children did not evade addressing this personal problem; they did however disguise it.

The story of the football fence is equally revealing; by replacing the fence with a sturdy climbing structure, the children had also solved their own, identified need to be able to climb more, and to greater heights. The fence would also prevent balls from escaping... Fortunate it is that children can find some way to express their needs, it is also sobering to see the extent to which they feel impelled to disguise their own needs with a mask of concern for others.

Week Eight Theme Listing

Case Study 1: Walther Rathenau School

TABLE M LIST OF ELEMENTS WALTER RATHENAU SCHOOL

No.	New Elements Chosen
2	Swing
3	Tower
1	Fort
1	Climbing frame
1	Slide
2	Benches
3	Pond and fish
2	Trees (tree-house)
2	Rabbit and hutch
all	Flowers
all	Grass
all	Sand
all	Birds
all	Squirrel

Week Nine Visiting the chosen place

Case Study 1: Walther Rathenau School

The results of this session can be seen in the positions chosen for the elements to be constructed. These are located on the plan of the playground. The children considered with care where their elements should be sited. The three boys, designing the pond, laid out three different ponds before they could decide on the final shape and size. The author's role was to question why they had chosen a particular location and to promote discussion rather than allowing one member of the group to monopolise. The boy constructing the benches took note of the pond builders, and sited his bench far enough from the edge so that no one would fall into the water, but near enough to allow the parent to look at the animals on and in the water.

The two girls constructing the rabbit hutches had to come to agreement with the two girls wishing to hang a swing from a tree. The shaded corner was chosen for the rabbits, away from the main path where dogs might run by, protected by the stone wall. The only tree with sufficient space around it to bear a swing was that adjacent to the rabbit hutches. Each group was most protective of their ideas, and a compromise was not found without tears shed.

The boys constructing the tower and fort had the dilemma of finding a suitable space within the small woodland far enough away from the electricity converter buildings, whose external walls were plastered with signs of, *Danger! High Voltage!* The children were aware that if the fort were built too far from the existing playground, it would be hard to monitor who was using it. They were also concerned with the need for secrecy, where play could continue unhindered by adult interference.

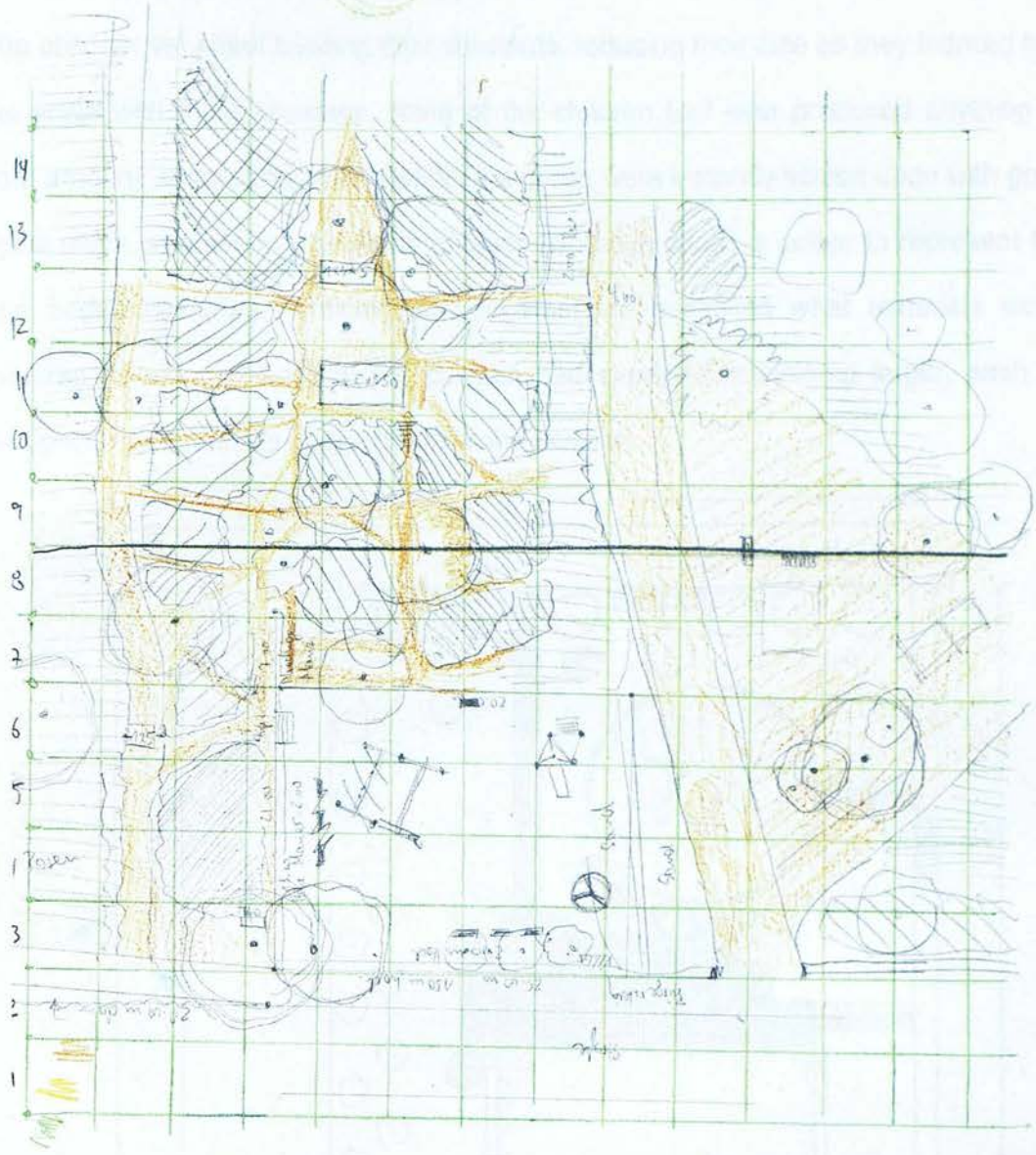

FIGURE 107 PLAN OF THE WEIMARHALLEN PARK PLAYGROUND

Case Study 2: Lucas Cranach School

The children were not allowed to visit the site, having no accompanying teacher. Having been encouraged to return to the playground in their own free time, the children came to the session enthusiastic to begin. Two girls went to collect grass, and the other children began to construct the base model upon which the elements would be laid. Their first

problem encountered was with the scale. The model was kept to 80x80 cm for the purpose of storage between construction phases.

The children set about building their elements, reducing their size as they learned to judge the scale with more accuracy. None of the children had ever produced anything of this sort, and any suggestions made within the group were instantly seized upon with gratitude. Lydia stuck on grass for the areas of lawn, two boys chose a colour to represent tarmac, and began colouring frantically and together we assessed what materials would be required. It was obvious that the children had expected something larger, each having brought large quantities of cardboard to the session.

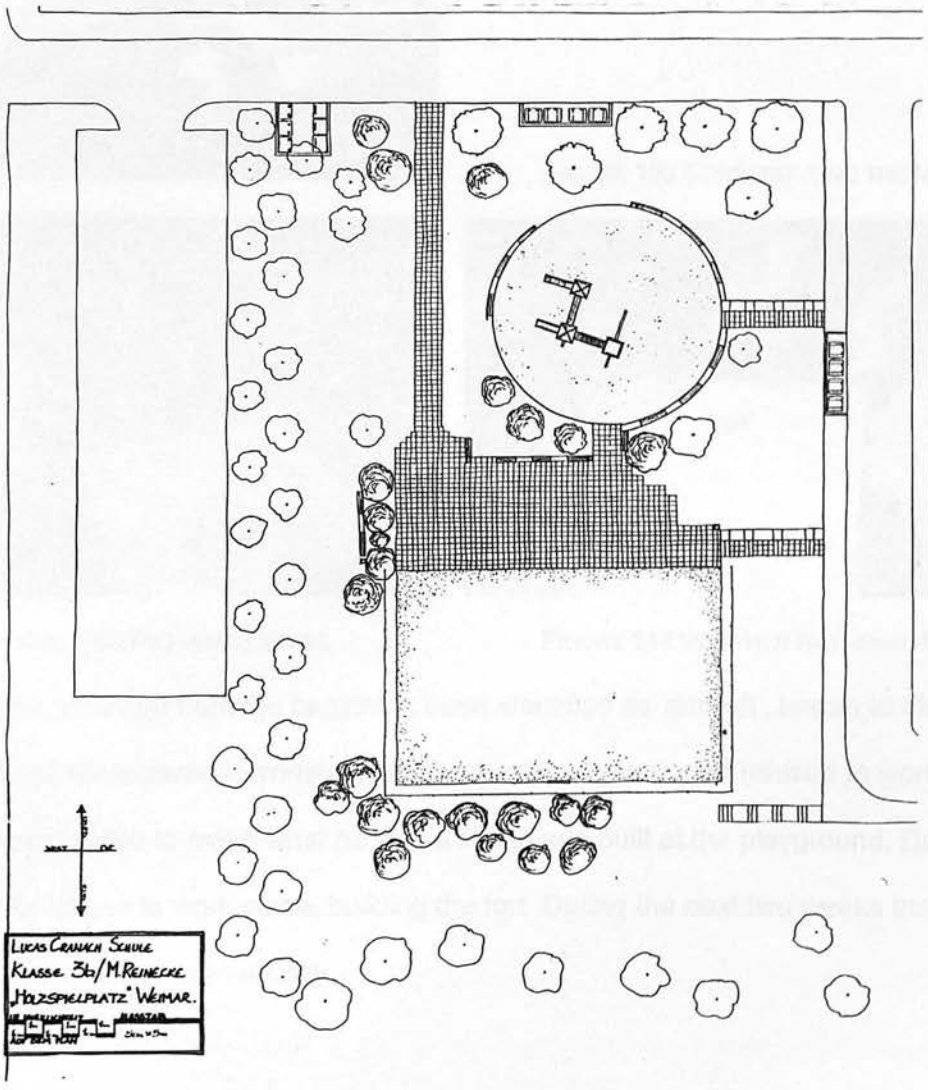

FIGURE 108 PLAN OF THE TIMBER PLAYGROUND

Week Ten and Eleven Constructing the Ideas

Case Study1: Walther Rathenau School

The children brought cardboard, scissors and glue, but little else to the construction session. The box of dried flowers, plasticine, kebab sticks, string, twigs and coloured paper gave indications to the children of the small scale of the model. Many of the structures were fiddly to construct, but the children worked to produce the model.

FIGURE 109 CONSTRUCTING THE MODEL

FIGURE 110 WALTHER RATHENAU MODEL

FIGURE 111 WALTHER RATHENAU MODEL

Two children, who had from the beginning been identified as 'difficult', began to blossom. Steve had not volunteered to construct any particular element, and refused to work in any team. He was invited to make what he would like to see built at the playground. Daniel, the second child, chose to work alone, building the fort. During the next two weeks their sense of self worth increased dramatically.

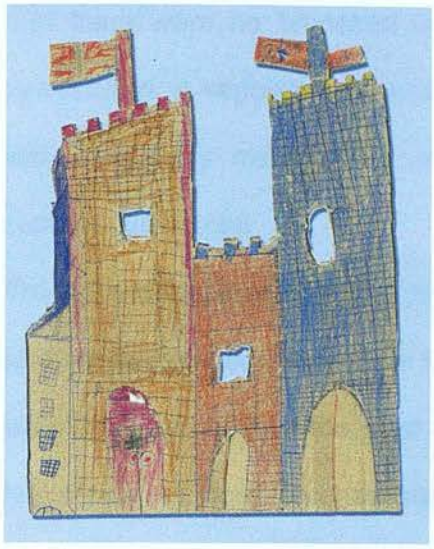

FIGURE 112 DANIEL AND STEVE''S CASTLE

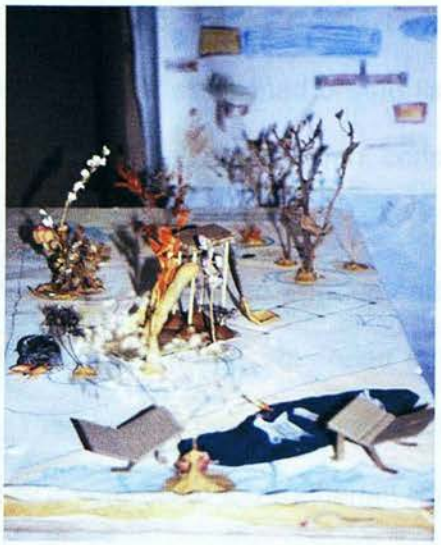

FIGURE 113 MODEL DETAIL

Having both continually 'failed' in their schoolwork; they finally had projects, of their own choice into which they could invest their energy. Steve produced a beautiful cutout castle, far too big to place on the model, but executed with consideration for the smallest details. Daniel required some help in constructing his fort; his attention-gaining pleas for help diminished in frequency as he gradually found out that he knew the answers to his questions. The concentration of the children was marked; each child was happily involved in creating their small world.

Case Study 2: Lucas Cranach School

The main challenge with the remaining twelve children was to encourage them to think independently. The children seemed to assume from the outset that they would not know the, 'answer' and so often did not bother to address a problem. Work progressed slowly on the model; they would not risk taking the first step. Once however, one child mastered the art of tree making, the others joined in. The children were concerned with the numbers of trees built, but not necessarily about the quality of their construction or their appearance. Interestingly, the last three trees to be constructed were the most adventurous. Three children decided to use irregular-shaped sticks as the tree trunks. This necessitated sticking on several 'bundles' of green paper, rather than one. The children were concerned

that there were no branched for climbing on the other trees. The last element to be constructed, a vegetation-covered tunnel, had not been mentioned on the list. Suddenly, with only thirty minutes left, one boy and various advisors began constructing the camouflage tunnel!

These children required more time than the Rathenau children to work up enthusiasm and to develop the necessary skills for crafting the model. The project ended at the moment when they had built up the most confidence. The ability of these children to discuss ideas together and to form a consensus appeared as a contrast to the Rathenau School. There, the children were encouraged to think independently and to take personal responsibility, but the children showed problems in working together.

FIGURE 114 PLANNING THE MODEL

FIGURE 115 LUCAS CRANACH MODEL A

FIGURE 116 LUCAS CRANACH MODEL B

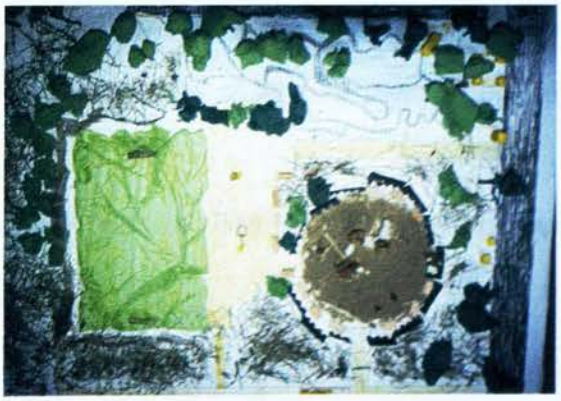

FIGURE 117 LUCAS CRANACH MODEL C

The Cranach children seemed loath to volunteer individual ideas for some fear of non-conformity, and could not bring themselves to begin a process without pressure from a

position of authority. Creative processes for these children were usually restricted to the art of copying, rather than an encouragement to express the unique perception of each individual.

Week Twelve Admiring the Results

Case Study 1: Walther Rathenau School

The Rathenau School children used their last energy to decorate their playground with flowers and flowering shrubs and trees. The rabbit hutches (two were made) were stubbornly built to another scale. Each carefully crafted rabbit had its own pen, food and decorative planting. The pond had fish, and a tortoise, and the tower built in the woodland had four windows and two doors on each side.

Where they could, with the meager time and resources, the children decorated their chosen places. The Cranach school reveled in bright colours and the Rathenau in many decorative details.

Case Study 2: Lucas Cranach School

The Lucas Cranach children made some unexpected additions to the models. The camouflaged tunnel is one example. This delicate structure was placed on the slope leading from the timber playground to the main road. The slightly serpentine form was created to be crawled through, or climbed over.

Bright yellow lavatory blocks were dispersed over the site, and the dull concrete paving replaced by something equally bright and yellow.

Conclusions

The question of *why,* the children chose some places and not others and *why,* they chose certain elements to improve these places can be answered more easily if we view the layers of the method together.

The Lucas Cranach school children predominantly live in the housing estate of Weimar Nord, an area, which bears the strong imprint of the socialist world order, which created it. The regularity of the houses, linearity of the streets, the repetition, the impossibility of privacy without the confines of the apartment, and the contrasting chaotic and neglected wastelands which flank the estate speak a certain language to the cognitive structures of those living there.

The Rathenau School children, in contrast, live in an area long-neglected during the socialist regime, the buildings are old, and undergoing a renaissance as coloured facades emerge from beneath grey and crumbling plaster. These children are part of the fabric of the town. Their playgrounds are parks and gardens, not playgrounds and wastelands. Most of the town is within walking distance, or accessible at least by bus.

The theme of contrasting the socialist 'island' and integrated town quarter could be followed in all the juxtapositions and contrasts, and we would be richly rewarded with information.

These results could also be used to investigate where patches of common ground expose themselves; with regard to how the perception of the child differs from our own.

Points of Shared Reference

The repetitious nature of the Weimar Nord estate housing blocks was, only too obvious to the Cranach children. Their detailed drawings must have caused them some agony of effort. In their attempt to negate the lifelessness of their homes, they took pains to draw as many as thirty different window treatments, on one drawing. This investment of effort is a remarkable indicator **of the will which children possess to strive against what they are given.** Some children exhibited less of this quality, and accepted the status quo more readily; their drawings were as monotonous as the concrete blocks.

The Rathenau children showed a similar spirit. They painted their homes in bright techni-colours, an illusion for the adult world. What these children had been witnessing was a

gentrification process of their neighbourhood; some buildings now sport fresh new colours, but many do not yet.

If a simple bush can be considered a tree-house, maybe planners have to re-adjust their own perceptions of the child's expectations – if the sun is shining, if the colour of the rainbow lends its presence, and if basic structures are provided for the child to read her own form and function into, then these children are happy. It could be that all children require is more flexibility in the play areas; the planning can be structured – bushes, trees, berms etc. but no definite purpose is assigned to these structures. It would be up to the children to read into the structure that which they need at the time.

Choosing favorite places was an enjoyable way of becoming acquainted with these children's psyche. The children were attracted to places abandoned and left lifeless by the adult world; the small gap site, the abandoned house, the old train engine, the junk yard, the green house, the Russian mountain, the ruined gymnasium. We may see no attraction in these places, be shocked by the shards of broken glass, the risk of imminent collapse of a building, the dirt and the litter. **Children come to these places *because* they are out-of-bounds to the ordinary citizen.** They can play undisturbed, and must not conform to rules or expectations.[4] The children do see the litter and the filth but have the power to transcend this. The example of the holes in the fence of the football ground, give a hint of **this ability to turn a problem into something of value.** Using old timber boards to build a tree house, 'imagining' a tree house, which to our eyes is nothing, more than the space between the earth and the lowest branches of a bush, these are **examples of the child's ability to transcend a situation.**

These aesthetic sensibilities could be labeled unreasonable demands from a child. They do however show how aware children are to the portrayal of harmony, beauty and care in

[4] See Stadt+Natur Gründler and Schäfer 1999

their environment. The children gave equal emphasis to their evaluation of *what* was drawn and *how* this was drawn, in fact they showed no sense of discrepancy between the two. Both required their opinion and an investment of their energy.

Differences in perception became obvious upon examining the proposals for the chosen playgrounds. The children could sometimes *see* things which adult eyes could not, and would also ignore things, which were apparently obvious.

What became apparent was **the tendency for children to see things, as they wanted to see them.** Their fine-tuned senses could appreciate the quality of the environment around them. They could use this sensitivity to manufacture their own worlds of fantasy. The Cranach children expressed this in the richness which some of them bestowed on the mat plainness of the housing estate facades. The Rathenau children showed this in the name given to a simple shrub on the ground, a tree house.

Perhaps the solution to this is to find a planning language where children are offered a basic structure, formed of elements, which encourage 'multiple reading'. For one, the tree is for climbing, for another, a meeting point, for a third its branches provide homes for wildlife. The fine structure of a playground, the positioning of stones, heaps of sand, planting flowers, making small shelters are areas where the children show themselves capable of exerting influence over the form of their environment. The Cranach children exhibited this capacity less so, but **showed the ability to explore and learn if given the freedom and time in an encouraging social environment to do so**.

When this quality is actively incorporated into the planning process, or used to address a learning problem, **if this is consciously recognised as a capacity of the child, the child experiences a sense of his empowerment for action in the world**.

Looking at the Contrasts

Two schools and two different settings; reference has already been made to differences in behavior and choices between these two schools. What is it which could cause such

differences, in the way the children are motivated, in the manner in which they represent themselves, in the richness and diversity of their ideas, and in the different way they perceive the elements which make up their physical environment?

Did the differences in environment produce differences in the children's needs? Is it possible to detect a build-up of emotional affinity, or its previous existence, and what were the factors, which facilitated this?

To have begun this analysis by looking at the two models rather than the 'Drawing on Improvements' of week 6, might have led to the conclusion that only the Rathenau School could suggest reams of play equipment, and the Cranach School had said all along that they wanted trees and grass... The Cranach model has lavatories and the Rathenau model has a pond and rabbits, **otherwise they are similarly equipped with play structures**.

What the children of the Rathenau School did show however was a concern and an understanding for elements and processes in the natural physical environment, which the Cranach school children had no apparent grasp of.

Week Six, Drawing on Improvements explicitly showed this difference in sensibility.

Positioning birds in the trees, incorporating trees into play structures, attaching swings into trees, drawing fungi on the tree trunk, showing ploughed earth, giving the wind a personality are all signs of a connection of open communication between these children and their natural physical environment. Sometimes the images showed in stark honesty the relationship of man to this nature; drawing E for example, with the small pavilion home to man and his dog, surrounded by nature.

We can read much from these drawings.

The contrast to the Cranach school is so extraordinary that this should command the focus of investigation. Why did so many children produce shopping lists of play structures, toys that could have found their home anywhere and which had been collected from a huge number of sources devoted to the entertainment of children.

The question is why did the two differ so much at the beginning, but at the end of the process, these differences became less marked?

An attempt is made to answer this in Chapter 7 where a more detailed analysis of the attitude towards the natural environment is presented.

Chapter 7

Hütschenhausen Kindergarten Data and Analysis Case Study 3

Introducing a 'Model' Sustainable Environment

Below is the analysis of a kindergarten planned and built in a participatory manner, using ecologically sound materials and planning principles to encourage the development of personal empowerment. The case study was chosen as a testing ground for design processes and vocabulary, in addition to analysing its success as a model for inspiring ecological consciousness in children. A reminder of the reasons for the choice of this third case study can be found at the beginning of the method on pages 113-114. An axonometric, a plan and photographs are included below for reference.

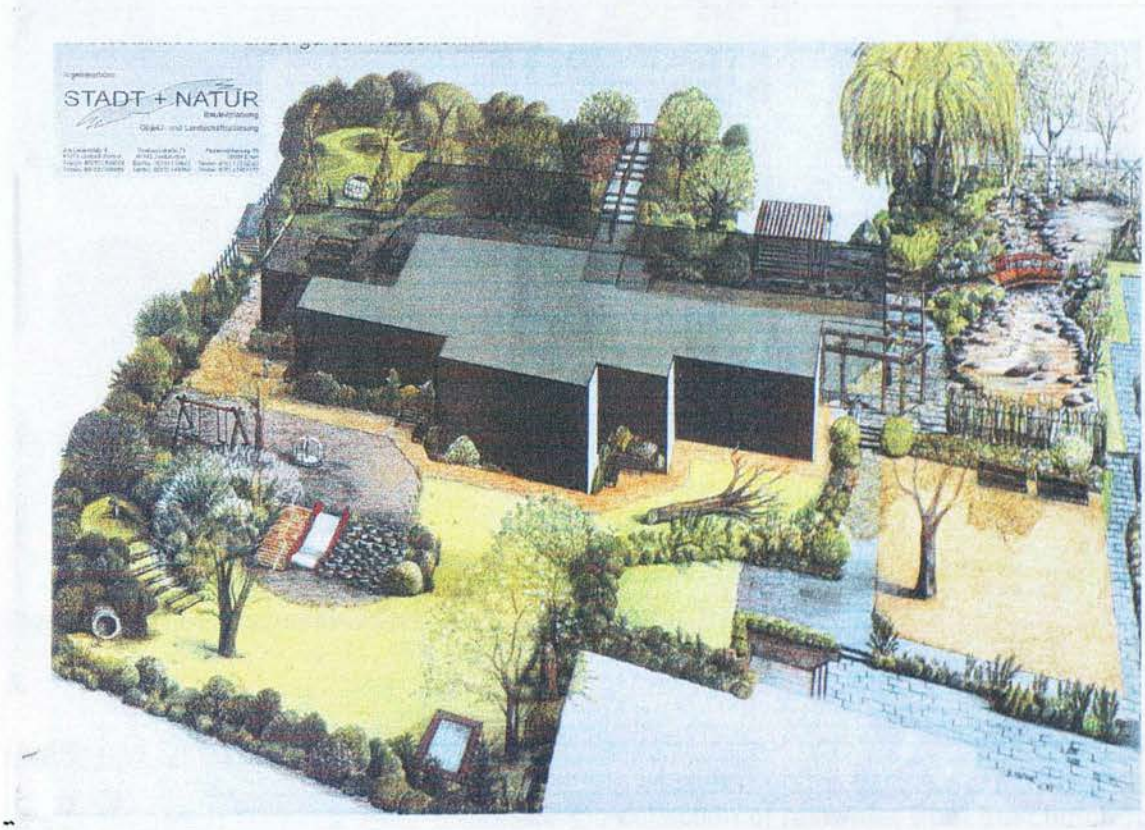

FIGURE 118 THE HÜTSCHENHAUSEN KINDERGARTEN AXONOMETRIC

Part 1 Analysing Sustainable Physical Contexts:

The criteria for analysis are grouped under four main categories:

A Water

B Material of plant origin (plants and timber products)

C Material of other origin

An itinerary of the physical elements (design vocabulary) with separated descriptions and analysis are listed below:

FIGURE 119 THE HÜTSCHENHAUSEN KINDERGARTEN PLAN

A Water

Health and Safety

The kindergarten built in a water cistern for the collection of rainwater from the church roof. In this, rainwater was maintained throughout the year to a quality, which approached that of tap water. The county of Rheinland Pfalz where the kindergarten is built has a law, which

specified the use of drinking water for children's play. The planning office, Stadt+Natur were able to argue that when water is stored in a deeply buried cistern, it can reach this quality without any processing thus ensuring safe water for play without resort to the mains supply.

Defensive or Preventative Costs

Density, variety and quantity of vegetation were increased positively, affecting the local water balance through the changes to *absorption*, *evaporation*, *transpiration* and *respiration*[1]. The planted hedges and native species shrub areas increased the area previously covered by vegetation more than 100%.

Analysis: Areas of planting serve to retain precipitating water within the area in which it falls. Water is released through evaporation into the atmosphere, and through ground water percolation into the water bodies of streams and rivers thus maintaining the natural water balance. The use of native plants species further improves the water balance. Native vegetation is adapted to the climate of the area, therefore requires less watering.

The water for the cistern is collected from the roof of the adjacent church and fed into the cistern underground. This is pumped by the children into the 'stream', played with, and allowed to drain away. The sand area directly below the pump and streambed was so constructed so that the pumped water would percolate into the ground before having the chance to evaporate, and be lost to the local water cycle.[2]

Analysis: Cistern water reduces the financial cost and increases the pedagogical benefit to be had by the children. The cistern paid for itself in saved water rates. The use of rainwater rather than purified drinking water benefits the wider community; there is less demand on

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[1]Local nurseries where 'organic' cultivation practices are still rare provided Vegetation. Non-organic cultivation ultimately degrades the soil through regular addition of soil conditioners, artificial fertilisers, and pesticides. This exerts further effects on the water purity, acid rain, and eutrophication being established indicators within the wider ecosystem.) Notes from lecture by Eric Caulton, "Environmental Biology - Ecosystems and Matter cycles". Ecologist Lecturer to Heriot Watt University. 1991

[2] For example: absorption of water is increased, through the decompaction of the soil: This is achieved by soil cultivation prior to planting, the addition of organic matter (which is added at regular intervals from the on-site compost manufacture), plant root growth and the establishment of a soil profile capable of absorbing water at the surface. See page 75 of ,Wasser und Natur erleben. Ökologisch orientierte Spiel und Erlebnisräume. The aims of the Water management authority for Rheinland Pfalz are proclaimed: that decentralised water management schemes should maintain the natural water cycle: restrain run-off precipitation to be absorbed and used in the area it falls.

the water purification authorities, and the kindergarten in self-sufficient in its play requirements.

Removal of Material

Children used less water when washing themselves or flushing lavatories within the building than before the implementation of the design.[3]

A crushed stone[4] substrate was used for the large level area so that water could permeate freely. The ground in the south area of the kindergarten was remodelled, so that natural drainage and additional functions could co-exist. The ground surfaces were chosen and constructed to allow precipitation to permeate to the ground water table. The design of the kindergarten removed much impervious surface area, replacing it with permeable grass, sand, mulch and crushed gravel areas.

Any pollutants resting on non-porous surfaces such as concrete or macadam are carried off into the main drainage with precipitation run-off.

Analysis: The installation of the manual water pump gave rise to an unexpected cost saving; the children accustomed themselves to operate the pump only after sufficient rain had fallen. They learned to estimate the amount they could pump from the well, relative to the amount of rain fallen. This acquired facility, then influenced the habits of the children *indoors* as well. Problems of poor drainage, water retention, and decreasing water table levels can result in high costs for the future.[5] The problem of leaching pollutants into the water table is also reduced, as natural materials have more capacity to retain small quantities of pollutants in their fine structures.

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[3] See,Wasser und Natur erleben. Ökologisch orientierte Spiel und Erlebnisräume. (Experience Water and Nature. Ecologically orientated play and experiential space) 1997. Available from the Ministerium für Umwelt und Forsten. Rheinland Pfalz, 55116 Mainz Germany

[4] In this case, the area of grounds to the Southeast of the site which is owned by the church. The church required an open space for yearly functions and allowed the space to be incorporated into the kindergarten grounds.

[5] Lowering water tables for example, can cause problems with the foundations of the building, leading to structural weaknesses

Use of Renewable Resources

Since the installation of the cistern and pump there has been a reduction in the use of other toys.

Analysis: Large groups of children constantly use the renewable resource of manually pumped cistern water to form play-scapes, sculptures, to 'cook' with, for sensual experiences mixed with mud, sand, stones, sticks. They use it for washing, for ‚mud painting', for measuring, practice in pouring, sliding and paddling.

B Material of plant origin (plants and timber products)

a. Vegetation:

Health and Safety

The vegetation chosen for the kindergarten is taken from a list compiled by Stadt+Natur, carefully ruling out any species where consumption of berries or leaves can be dangerous. Nettles are left however in the corners, for the children to be given the opportunity of experiencing, 'what happens when I touch this plant?' Children are allowed, even encouraged to climb the trees and shrubs. Seven years after the implementation of the new design, the bushes have grown up, and provide a perfect refuge for the children to hide, make camps, and play, undisturbed by the adult world.

Analysis: Through experience they learn – they also learn for example that butterflies are attracted to the white flowers. The inclusion of stinging nettles is a 'nod' to older cultural practices, where Urtica urens was collected for tea, use as a vegetable or for weaving into cloth. This is typical of Stadt+Natur's approach, where the plant's cultural value is considered in addition to the ecological and pedagogical.

Climbing trees is an important experience; *A climbing frame always conveys the same set of conditions. A tree however, has variation in the structure of its branches, the higher up the tree, the thinner are the branches. In summer the tree's branches are clad in leaves, in winter there are none. The child experiences a totally different manner to perceive*

differentiated information from his environment.[6] The present generation of parents have problems with this attitude, seeing the potential danger. The kindergarten staff continue to educate parents to the fact that a child will only climb as far as she is able, for the child is in full possession of her own abilities.

There are several small mounds in our grounds, which have been so densely planted with bushes that the children can hide themselves in this jungle. This use of the bushes, identified by Frau Lambrecht has also caused anxiety for the parents of the children. Their concern for the whereabouts of their children when coming to collect them has pushed the staff into an educational offensive of the necessity for this kind of private play. The parents find this hard to accept in a culture where children are constantly under observation.

A current concern for parents of the kindergarten children, is the fact that their children are not always visible when the parents come to collect. The places where children can play undisturbed have become rare, especially in urban areas. Stadt+Natur argue that this is what children need. Undisturbed and yet protected from the insecurities of a hostile environment, children can play without fear of interference or judgement in the under-story of bushes. Frau Lambrecht witnessed the effect such independent play has on the behaviour of the children, she still has to defend herself to the parents.

Defensive or Preventative Costs

Few signs of over use exist, such as bare earth patches, compacted soil and damage or poor health of vegetation. Weeds are kept back through natural plant competition, 'weeding' by the children, or by the application of mulch.[7]Energy - intensive fertiliser and weed-control products are not used. Native species are planted, ensuring a rapid growth rate, which can accommodate wear.

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[6] From a lecture given by Frau Lambrecht, Principal of the kindergarten.

[7] Mulch and compost are by-products of the yearly maintenance 'fete', where cut willow and other shrubs can be shredded, composted, or carted off the site to provide raw material for another scheme.

Analysis: With more than sixty children, divided into four groups actively using the grounds, areas of intense usage reveal themselves through decreased plant growth, worn turf etc. The fact that such patches rarely occur is an indication of the near even distribution of the children's activities within the grounds. Previous to the design implementation, the children spent a higher proportion of their time both inside, and in the near vicinity of the building. This behaviour has altered, and activity is spread throughout the 1600 square metres.

In this way, the kindergarten is designed to accommodate fluctuations in intensity of use.

Two measures of intensity of use[8] are *the quantity of fertiliser and pesticide used in an area*, and the *resulting erosion incurred* by activity.

Removal of Material

The vegetable and herb gardens are yearly re-stocked, harvested and the waste disposed of to the compost heap. In addition, plants are allowed to grow to their natural form, without being checked by pruning (other than that of the children).

Analysis: Far from removal, the kindergarten is constantly adding to the cycle of vegetation.

Use of Renewable Resources

Vegetation provides most of the structure[9], decoration, and play material (in the form of seasonal products such as: fruits, seeds, leaves, sticks, fallen twigs, mulch, and flowers) in the design.[10] The recumbent climbing tree, turf sods (which form the 'nest') balancing logs mature trees for climbing and 'Jungle' area are such play structures. Many structures in the design are multi-purpose. One object can satisfy needs where other designs may have used two or more, for example: The recumbent tree provides spatial division, provides seating, wind-shelter, balance and climbing opportunities, tactile experience, and

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[8] As defined by the BUND/MISEREOR report.

[9] Hedges, willow houses and tunnels, lawn, massed bushes, in 'living' vegetation, and, pergola, toolshed, planting bed retention, swing-retort, steps, log-benches, climbing log, pathway, mulch-covered areas, as 'harvested vegetation'.

[10] The maintenance scheme relies on renewable energy for its input. Maintenance is explained under the heading of removal of material.

the rare view of intact tree roots. Similarly, bushes are planted for shelter, spatial definition, wildlife habitats, education about flowers, fruit and berries, and for climbing in and on. Other such elements are: the grass slope for rolling (cars and children), sliding, sledding, climbing up, drainage purposes and spatial division. Turf niches for seating, material storage and wildlife habitats. The maintenance scheme employed distributes and produces compost material, made on the site, eliminating the need for additional soil enrichment.

Analysis: The natural conversion of sunlight through photosynthesis into plant material forms a renewable energy source. The abundance of these naturally produced bio-degradable 'toys' eliminate the need for expensive play equipment whose life-cycle ends in burning or consignment to the rubbish tip. The plants contribute positively to the carbon balance of the atmosphere and do not require the processing of metal-framed play structures. This is a more sustainable use of materials than conventional object-strewn playgrounds. The native plants are fully adapted to the soil conditions and microclimate of the area.

b. Construction Material

Health and Safety

None of the timber used in the construction of pergola, swing frame, timber climbing slope, storage house, balancing logs, timber sets, and benches are impregnated with polluting heavy metals to preserve their durability. The timber has either been treated with natural wax-based solutions, or is naturally durable such as larch-wood.

Play equipment is constructed according to the latest play equipment safety standards compiled by Stadt+Natur[11].

Analysis: Safety is a contentious issue in any play environment: Most manufacturers of play equipment design with the insurance companies in mind. Often play equipment is

[11] See text on safety at end of the chapter.

under-challenging the child in the interest of preserving her safety. The office of Stadt+Natur brought out their own brochure for the Land of Rheinland Pfalz and Hessen [12]putting forth their idea of safety. Stadt+Natur take the approach of 'learning through experience'. Stadt+Natur allows elements of danger, so long as it is physically possible for children to triumph over, (and conforms to rigorous standards of construction[13]). This facilitates the development of personal trust in ones capabilities, fundamental to any forming of personal responsibility.

Removal of material

The construction timber comes from renewable forests in the vicinity of the kindergarten.

Analysis: When the logs begin to rot, they will end their ecological cycle as newly made earth on a compost heap, thus maintaining the local ecology.

Defensive or Preventative Costs

Using second-hand material for the climbing ramp, timber sets and balancing logs.

Analysis: This diminishes the price and the impact made on the environment.

Decimation of Non-renewable Resources

Ropes hung from the trees, timber swing seats, sticks for playing, pieces of sawn wood for the sand pit; are some of the materials used for play. Additional toys are long-lasting, plastic buckets, shovels and rakes, bikes, trikes, balls, stilts, hoops, ropes and wheelbarrows.

Analysis: The first group are free from processing, collected on the site or locally, and pose no threat to the stability of the local ecology. The second group is long lasting due to high quality of the materials used, therefore incurring less damage than several cheap articles.

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[12] Naturnahe Spielraüme in Kindertagesstätten for the Unfallkassen Hessen and Rheinland Pfalz. (Near-natural Playgrounds in Educational Establishments for the Health Insurance Board of Hessen and Rheinland Pfalz) Written by Stadt+Natur, Klingenmünster. May 1999

[13] See TÜV and GUV standards. DIN standard 18034 "Sicherheitsmassnahmen sollen Gefahren für die Nutzer möglichst ausschalten, aber auch einen Freiraum lassen, damit Kinder und Jugendliche frühzeitig lernen, Gefahren zu erkennen, um sich entsprechende Verhaltensweisen anzueignen. 'Safety Standards for Play Equipment

C Material of other origin

Health and Safety

The majority of the features of the kindergarten are created using biodegradable products. The trampoline, (introduced for its positive benefits to the senso-motory development) is not biodegradable.

Analysis: The planners argue that the gain in bodily control outweighs the ecological impact. A natural alternative would be preferable (such as swaying branches) thus reducing the negative impact on health of industrial pollution associated with waste disposal.

Removal of Material

Little material was removed from the original kindergarten, although some 136 m^3 of soil were re-distributed within the site for the slope formation in the south area. No soil was brought onto the site.

Analysis: This was a disturbance to the soil resource, but one from which the soil could structurally recover. The resulting slope is now used intensively for play.

Defensive or Preventative Costs

Local products were predominantly used. Water-bound surfaces of crushed stone, a small quantity of original concrete pavers, recycled bricks with drainage gaps in-between, earth, pebbles, timber used as sets, or mulch were used for the ground surfaces. Implementing the design required machinery for earth movements and installation of ground surfaces and equipment. Most of the elements are long lasting, so that initial investment in energy required for manufacture diminishes its impact.

Evenly distributed attractions decreased the *intensity of use* by the children, due to the reduced compaction in the vicinity of the building.

Analysis: The use of local products diminished transport distances and therefore consumption of fossil fuels. The high proportion of natural elements can be maintained and installed with little expense of fossil fuel energy.

The materials chosen for the ground covering no longer need to withstand such rough treatment and a sustainable alternative to hardwearing concrete and macadam was used.[14]

Decimation of Non-renewable Resources

Any existing feature holding intrinsic value was carefully incorporated into the design. These were re-conditioned, improved, and re-positioned.[15]Donated material with minor flaws, or those given as donations for tax-exemption purposes, (such as the half-buried concrete pipe section in the Southwest corner) have been utilised. The plastic drainage pipe was recycled as a communication system, the pipe was buried underground, with two standpipes through which the children speak. Old tyres became a safe and challenging variation with the combined function of staircase and slope retention. Stone boulders were used for 'stream' edging, seating, climbing, sand play tables and for building. **Analysis:** Compromises in material were based on the non-availability of ecologically sound alternatives[16], or where materials with relatively high-energy consumption were recycled for a new use.

Boulders, sand, cement, concrete and stones, are non-renewable resources. These were used to form the streambed. Concrete is a refined product and its use is questionable in this context.[17] Transport costs and distances travelled reduce the positive balance to a minimum.

Resource-intensive play equipment, requiring large amounts of energy for the manufacture; were chosen for their ability to facilitate senso-motory experiences. These include the latex-based trampoline, small vehicles, and the slide. Their use was justified for the sensual experience facilitated.

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[14] Such non-porous surfaces create extra problems, in that they push the problems of drainage and absorption of water to their extremities: not only is water not absorbed over the surface, but the run-off from such areas creates a problem of uneven distribution of surface water, leading to erosion problems, if these are otherwise unchecked through diverting drainage, to the formation of gullies. Both effects result in imbalance in the natural water cycle of the area.

[15] (for example, the swing, carousel and entry staircase - which was decorated by 'chimes' made from painted recycled pieces of metal.)

[16] (for example, the PVC rainwater drainage pipes, used for the 'walkie-talkie', or the rubber trampoline)

[17] A clay lining would have been more sustainable, if such material was available locally, this was not the case however.

Part 2 Analysing Democratic Governance Structures

This can be assessed using the following four categories:

1 the daily running of the kindergarten

2 the planning of the physical environment

3 the building of the physical environment and,

4 the maintenance of the physical environment.

1 the daily running of the kindergarten

Choice of Design

The design of the kindergarten aimed to reflect the pedagogy of the learning establishment: Their aims were stated, *It should be an environment in which children of differing personality, age and sex can feel stimulated by the diversity of learning and experiential possibilities.*[18] The principal further states that, *the experience of acting in and with nature must be a fundamental part of the child's life and learning.*

The grounds were to act as the forum for further development of educational strategies; free play is encouraged, with emphasis on development of the individual within a socially protected environment.

Analysis: The manifold of niche environments, distributed around the building, protected from the outside world by a soft barrier of vegetation reflects this. These niches open out onto a series of inter-connected larger spaces, where the kindergarten groups can gather for play and exchange. The social element of respect is encouraged by the design: the children are free to operate within an environment especially tailored to their developmental needs. This is what Rebeca Wild[19] refers to as, *the prepared environment"*

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[18] From Frau Lambrecht's lecture given to the kindergarten parents in 1998

[19] Education for Being. Wild, Rebeca

of the Pesta Schools. Conflicts are minimalised; the pedagogical borders to activity are set by the capability of the child.

FIGURE 120 WILLOW TIPEES

FIGURE 121 VEGETABLE BEDS

Exposure to new experiences

The kindergarten principal, a working-class father, a four-year-old child, a university professor mother, and a planner typically worked side by side in order to construct the willow tunnel. The willow structures were built using traditional methods of basket weaving which the planners demonstrated. The planners guided the laying of the edge to the *stream.* Stadt+Natur additionally guided the parents and children in managing and planting the soft-fruit, herb spiral, vegetable beds and compost. Annually, interested children form a group to decide what should be planted. They then take on the responsibility to plant, water and weed the beds.

By encouraging and directing self-help, Stadt+Natur provide an opportunity for parents and children to learn about qualities and natural systems of the local ecology.

The planning process necessitated a disbanding of any remaining patriarchal relationships between the kindergarten and the children's parents. These are the *traditional knowledge and practices,* which Roger Hart describes as being so essential to coping with change in

the environment.[20] Most of these practices are beyond the daily experience of our culture, where most of us no longer engage in agriculture.

2 the planning of the physical environment

The protestant church owns the kindergarten. It holds seventy children between the ages of three and ten years, and seven kindergarten teachers. The six to ten-year-olds attend during the afternoon.

The principal asked the office of Stadt+Natur to design the grounds. A team was formed, comprising the landscape architects, teachers and interested parents. This team generated the first proposals and analysis of existing conditions over an intensive one-week period. The children of the kindergarten worked on projects following this. They were introduced to the proposals and encouraged to comment on problems of the existing site.

Communication channels were kept open throughout the planning and realisation stages. This relationship is still maintained through regular visits by the planners in order to photograph and chart the development of the kindergarten grounds.

The landscape architects acted as the process facilitators, responsible for steering the participants in their quest for a suitable environment. Democratic decision making was key to the design process. The building stage required the supervision of the planners, in order that any constructions were safe and durable. Details for construction and coaching for this in the form of on-site weekend workshops were also provided. The ultimate positioning and detail construction of individual elements rested on the 'builders'- the parents, children and educators.

The protestant church, which owns the kindergarten, expressed their wish to create an outside meeting area where the church could hold events. They subsidised and provided

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[20] See page 242 The Environment for Children

more land for the building of the water-bound surface area in the Southeast corner of the playground, beneath the large horse chestnut tree. The protestant church holds outdoor functions there which, provides the local community with a means of familiarising themselves with the design of the kindergarten grounds. Although the kindergarten is accessible out of school hours, almost no vandalism has occurred.

During the implementation of the design, the US Army, a community group, the parents, teachers, and children all contributed.

Analysis: *Environmental education curricula often imply that there is a clear and unquestionable set of environmental problems that have been defined by professionals....and these usually ignore the realities of the living environments of people.*[21] These 'problems' were for the most part identified by the children and teachers who were actively involved in the building process, which spanned a period of two years.[22] The commitment of the educators, and children to the project of improvement gave rise to the development of strong social ties among all the parties.[23] This method encouraged interaction between age and user groups in society. Hart emphasised the importance of interaction; *We need more models that genuinely recognise the untapped competencies of children to take a significant role in community-based sustainable development, particularly when collaborating with adults.*[24]When different groups express their needs and interests, a dialogue is created which can in turn spin off to affect other projects, causing social changes, which have consequences for the future.[25]

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[21] See Hart Page 249 The Environment for Children

[22] This is the Primary Environmental Care principle proposed by Satterthwaite, Hart and others in "The Environment for Children - Understanding and acting on environmental hazards that threaten children and their parents. Earthscan. 1996. " It is time for a deeper, more grounded involvement of citizens in the environment that builds on their knowledge and capacity and addresses their needs and priorities. " Page 245.
See also Gibson, T. The Power in Your Hands

[23] Gleaned from interviews with Norbert Schäfer and Helga Berger from STADT and NATUR, with Frau Lambrecht as Kindergarten Principal, and from pages 43-46 : Wasser und Natur erleben. Ökologisch orientierte Spiel und Erlebnisräume.1997. Available from the Ministerium für Umwelt und Forsten. Rheinland Pfalz, 55116 Mainz Germany

[24] Hart, The Environment for Children 1996

[25] See Gibson, The Power in Our Hands .Example of Liverpool housing scheme.

3 the building of the physical environment

Participatory Realisation

The parents, educators, children, army, Stadt+Natur and a building firm implemented the planned changes. Parental help closely coupled with child-initiated alterations and extensions continued over a period of three years. For example, the willow structures and sounding bells were largely child built, the streambed and sand play area were built by a firm. The children were prepared to carry huge bundles of willow twigs, to weave them into the willow tunnel and tipees. They carted barrow-loads of soil from place to place, helped to set the pathways, played in the piles of building material, and otherwise felt at home with the immense alterations being carried out to their environment. The photographs below illustrate the scope of this involvement.

FIGURE 122 WEAVING THE WILLOW TUNNEL

The children's presence may have extended the time needed for building, but the benefit of their acceptance of the scheme, of their concern for what was built and their contributing ideas balanced any inconvenience on the side of the adults.

Such contentment may not be taken for granted; German society, in particular, is orientated towards establishing security and towards achieving thoroughness in all that is carried out. Usually this outlaws direct participation in the building process. Through direct

involvement, the children were able to accept the change to their environment, and develop a sense of ownership for what they had helped to build.

4 the maintenance of the physical environment.

Replacement and Maintenance Costs

Maintenance work is integrated into the kindergarten children's daily routine. Extra repairs are completed during a yearly work-fete comprising of parents, teachers and children. Equipment and machinery is lent for the occasion, the work is voluntary. Materials are either recycled,[26] donated or bought.

Analysis: In this way the cost can be kept to a minimum, and is not a preventative factor to upkeep. Growing willow for example,[27] adjusts to slight changes in use and seldom suffers damage when adequately watered. The strong identification built up by the children during the building process is carried over to the new children in the kindergarten during their play. This is not the case with all the parents however; some of who expressed displeasure at the wear and tear on the children's clothes. New parents first have to be convinced of the positive benefit of such experience.

Where pupils are provided with a pleasant environment they respect it and when they have contributed to it they treat it as their own....We believe that this sense of participation in the ownership of a school plays an important role in the way pupils behave.[28] Children who had spread grass seed on the area that was to be the lawn were less likely to rip that same turf out in the future.

This attitude to responsibility extends further, with the design tenet that; *nothing is ever fully finished, or perfect*[29]. The designs are finished to the state that they can be used but,

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[26] Such as the willow cuttings which can be used to repair or create new structures.
[27] Used in the willow tepees, fence, tunnel and walkway.
[28] Taken from the Elton Report: Discipline in Schools Report of the Committee of Enquiry chaired by Lord Elton 1989 HMSO 0 112706657
[29] Norbert Schäfer 1998

space is always left for change; either drastically, if one element no longer appears in active use, or, gradually.[30] With this freedom comes a responsibility for how the area will look and function in to the future.[31]

Part 3 Analysing Empowering Learning Processes:

A. Reading the Environment as Text- detecting the hidden curriculum of empowerment

B. Assessing the Child's Active Experience

The most obvious semiotic *messages* of the kindergarten design are presented below in a table form, where the interrelated nature of the subject can best be expressed. Accompanying these semiotic messages are the possible activities and learning processes, which are enabled by this environment. It is necessary to state here that the author is not comparing this environment to any other. This is a self-proclaimed 'sustainable project' and has received recognition within Germany for this achievement. The following is an analysis of the elements, which comprise such a design and the resulting processes, which bring the child along the path of independent, responsible learning.

TABLE N CODED AND UN-CODED TEXTS HÜTSCHENHAUSEN KINDERGARTEN

[30]The small 'council ring'[30]to the Southwest corner, which became an area to store the children's building materials...).

[31] Our challenge is not so much to seek ever more sophisticated technological solutions to environmental problems, as it is to re-establish an emotional relationship with the natural world, to seek to " reanimate"[Peat, 1991] our scientific view of the world and to restore a sense of spiritual stewardship. Taken from: Spiritual Stewardship in Aboriginal Resource Management Systems. Mary Ellen Tyler. Printed in Environments 22/1. Journal 1994

A. Environment as Text		B. Active Experience
Coded messages	**Un-coded messages**	**Active Experience**
'We' represents the opinion of the kindergarten teachers and planners	'I' represents the experience of the child.	These are the activities engaged in by the child.
North-west corner		
Fireplace: We encourage children to learn about the danger and responsibilities of fire. Our fireplace is therefore used only in the presence of adults.	**Fireplace:** Heat, energy, light and excitement of fire. The scent of burning, the experience of transformation of material into energy and ash.	**Fireplace:** Children can cook simple food for themselves (potatoes which they harvested themselves). Children are encouraged to translate their experience to the smaller scale of lighting birthday cake candles indoors.
Willow tepee village: We encourage role-playing, which is undisturbed by scrutinising adult observation. We do not need to kill the vegetation in order to use it as a building material.	**Willow tepee village:** Plants can adapt enthusiastically to human suggestion providing it is within its structural capacity. Patterns of light filtered through woven structure. Metamorphosis of form as plants grow: symbiotic design of human builders, and growing plants.	**Willow tepee village:** The children built and maintain the structures. Sites for storage (tricycle garage), hiding and for role-playing. Awareness of physical properties; how far can I bend a willow twig – when green, when brown... Observations of the effectiveness of a plant structure against incoming precipitation, and the patterns naturally formed.

Vegetable and Herb Garden: We provide you with the opportunity to plant, maintain, harvest and eat fruit and vegetables. Participation is possible by joining the 'planting group' and therefore taking on active responsibility.	**Vegetable and Herb Garden:** Changes in soil texture, moisture retention and friability over the year. Development of small seeds into fruit bearing plants, as a result of the sunlight, water and the 'food' quality (mineral) of the soil. Observable relationship of watering and other maintenance, and plant quality including size and quantity of fruits harvested.	**Vegetable and Herb Garden:** Reading plant health as indicator of the need for maintenance. Planning a garden – when to plant, thin, water etc. Developing a caring relationship to the plants. Tasting and cooking the harvest. Composting the waste, for future regeneration of the soil.
Small animals: children can take responsibility for small animals. (The kindergarten has since given the animals away due to problems of responsibility during the holidays.)	**Small animals:** connection between quality and quantity of food, the temperature, and the health and vitality of animals. The softness and warmth of fur. Animal's instinctive affection or rejection...	**Small animals:** feeding, cleaning, brushing and holding the animals. Collecting and preparing food and bedding. Replenishing the compost heap with manure.
Compost: this is a place to witness the cycle of life. We view it as a valuable learning microcosm, and access is never restricted.	**Compost:** smell, steam in the cold, changes to texture, colour and moisture, the presence of other animals and scent over time.	**Compost:** children collect for, turn and distribute compost
Jungle: You may hide, and we respect your need to play in privacy without our direction. We are always near enough to turn to if you are in trouble.	**Jungle:** The natural form of the plants provides us with spaces to hide and play in. Seasonal change can be measured by the flowers, leaves, and fruits. Differences in texture and	**Jungle:** Touching, climbing on and under, and eating from the shrubs, I become familiar with their qualities without the need for instruction.

	patterns of shadow on the ground.	
Sensory path: We encourage sensory perception through your feet, and when using any of the wheeled vehicles– experience the differences between stone sets, pebbles, gravel, timber sets, and logs.	**Sensory path:** Changing conditions of temperature, texture (shine and matt) and slipperiness according to the weather. Changes of texture and comfort, when driven over, changes in speed and ease of movement (friction).	**Sensory path:** Driving, running, walking and crawling. Balancing and feeling.
Equipment house: We provide you with a storage building for the vehicles and expect you to put these away at the end of the day.	**Equipment house:** Temperature differences inside/outside (presence of frost on winter days compared to inside the kindergarten building proper). Temperature and moisture increases intensify the scent of the natural wood preservatives.	**Equipment house:** Spatially organising vehicles. Taking out and putting away that which has been played with. Caring for the well being of the toys.
South-west corner		
Planting at building: we need not separate building from the natural world beyond it. We provide mini 'laboratories' for investigating insects, and plants, which can be taken into the building through any door.	**Planting at building:** contrast between built form and naturally grown form	**Planting at building:** children harvest flowers, and observe insects
Walkie-talkie: We like you to learn to listen and talk with each other. Re-use plastic, in the recycled	**Walkie-talkie:** distorted sounds. Believing in something you can't see.	**Walkie-talkie:** sound experimentation, understanding and listening

drainpipe used.

Turf eyrie/store-place: children may withdraw. We provide a variety of play habitats. Steps can be constructed out of many materials (the steps are of turf).	**Turf eyrie/store-place:** grass is soft and retains precipitation. Height differences exaggerate spatial separation.	**Turf eyrie/store-place:** children move materials around Talking, 'reading' books.
Swing: We encourage these kind of self-propelled and self-determined senso-motoric stimuli. Double swing allows simultaneous swinging of two or more children.	**Swing:** Changing perspectives, objects 'move' about the swinger. Changes in altitude alter the range of sight. Individual rhythm of swinging. Experience of gravity/perceived weightlessness.	**Swing:** Experiments in propulsion effectiveness, in balance, jumping from a moving object, in co-ordinated swinging with one or more children.
Carousel: To make this work you need to co-operate with each other. We recognise your love of turning and its role in the development of balance.	**Carousel:** Experience of centrifugal force. Increased speed requires a firmer holding grip. Speed causes blurred vision. Increasing the number of children (weight) who ride simultaneously can increase speed.	**Carousel:** Acting together to bring about an effect. Decision-making – who turns? Who Stops? How do we make it clear we want to stop?
Broad slide: We encourage you to experiment together – the slide is broad enough for four children.	**Broad slide:** Properties of metal, which change according to temperature and precipitation. (Sticking to the metal, 'burning', 'freezing'.)	**Broad slide:** Sliding seated, lying on the back or the front of the body, together or alone. Climbing up, and judging the necessity to move away from the slide base.
Hercules slope:	**Hercules slope:** Changes in	**Hercules slope:**

We can make something of use from recycled timber boarding. We encourage you to test your strength.	ease of climbing due to weather, type of shoes worn by children and the strength in their arms.	Testing endurance/strength. Confronting personal limits, and overcoming these through repeated practice.
Tyre Slope: We can use recycled material to make interesting climbing experiences. Worn tyres filled with concrete fulfil retaining function and the softness of the rubber is child-friendly.	**Tyre Slope:** Smell of sun-warmed rubber, texture of wet rubber, elasticity of tyres when stepped or climbed on (the resistance). Transformation of ugly waste product into element providing stimulus and challenge.	**Tyre Slope:** Climbing up and down, sitting, slithering... Testing the springy nature of rubber compared to the concrete infill.
Grass Slope: You may walk, roll and lie on the grass. We appreciate the value for play of a simple grassed bank. We allow you to dig on the grass; we value the experience of close contact with the earth.	**Grass Slope:** Variable soil conditions (mud, dry earth, etc.) and grass conditions (colour, length, dryness, friction, snow cover. Variation in perception between level and sloping ground.	**Grass Slope:** Sledding (in winter), rolling, climbing up, sliding down, rolling vehicles, standing, turning, learning balance, digging holes, finding, insect larvae, beetles, snails, stones, and levelling the earth again.
Concrete pipe section: can be recycled and given an alternative use. We accept your need to be unobserved.	**Concrete pipe section:** Underground stagnant air, musty smell, damp and cool.	**Concrete pipe section:** Sound and echo experiments. Secret activities.
Climbing trees: We see climbing as necessary for balance, judgement and endurance testing. We trust your ability to judge how far you can	**Climbing trees:** An irregular climbing frame, offering seasonal variation (flowers, leaves, fruit, colour) and unpredictability of structure; branches are	**Climbing trees:** Testing strength, of trees and body, and personal resolution. Experience seasonal change and a bird's eye view.

climb and how you should get down from there.	thinner and suppler higher up.	
Tree swing and ropes: Provisional equipment is as effective as catalogue-bought play equipment. Simplest elements (rope) can offer a wide range of sensual experience.	**Tree swing and ropes:** the child can determine his own direction of movement. Awareness of the impact of weight on the branches of the tree, through sound (the rustling of the leaves, moved by the swaying branch)	**Tree swing and ropes:** Turning, climbing, swinging,
Sound tree: We can metamorphosise scrap metal into something of beauty – rubbish is a relative definition.	**Sound tree:** changes in wind speed, strength and direction alter the sounds. Differences between man-made and natural 'wind' sounds become more conscious	**Sound tree:** listening and looking at the swinging scrap-metal chimes, assessing the wind and its direction
Sounding-stone: We offer you a simple instrument made out of a chunk of stone.	**Sounding-stone:** Textural experience of touching, and the perception of slight vibrations from the sound generated.	**Sounding-stone:** My action can bring about a sound, and this I can control in rhythm and intensity. Climbing and sliding over the stone boulder.
Rubber trampoline: Your love of jumping is something we respect, we recognise the experience of balance, which it can bring. We have made it large enough for several to jump simultaneously – we encourage social interaction. There is a place for technical innovation, if it can enhance	**Rubber trampoline:** Experience the stretching capacities of rubber – why does it bounce back? Changes in balance necessary with additional 'jumpers' causing a wave-ripple effect Heat absorption and dispersion by black surface.	**Rubber trampoline:** jumping, movement, physical strength. Co-ordinating individual movement with other children – co-operation.

what is natural

Spatial divisions: We respect your wish to define your own play territory. We acknowledge that different kinds of play require different spatial forms.	**Spatial divisions:** Juxtaposing smaller and larger spaces leads to subconscious spatial awareness. Spatial character perceived through inherent differences in light and shade, ground plane, and colour and texture.	**Spatial divisions:** Active choice of play area based on perception of inner needs. Transition, through movement from one spatial character to another.
Recumbent tree with roots: You can see the whole tree, branches, trunk and roots. Chopping a tree down is not the end of its life. This tree is open to your interpretation, to estimate your balance and to climb on.	**Recumbent tree with roots:** Differences in texture and ease of climbing depend on climatic conditions. Textures change with time and effects of weathering and gradual decomposition.	**Recumbent tree with roots:** Picking away the earth to expose and understand the roots. Climbing onto, balancing on, slipping and jumping off, 'riding' on and for roll-play scenarios as a many-sided prop.
Hard surface area: We co-operate with the church and accommodate their needs with our own. We provide space to play ball sports and to ride small vehicles.	**Hard surface area:** Complexity of naturally formed patterns from scattered pebbles and the drainage patterns of precipitation. Changes in texture according to water absorption; acting as a climatic indicator.	**Hard surface area:** Using wheeled vehicles, and playing football. Developing awareness of traffic situations.
Benches: Teachers like somewhere comfortable too. There is enough room to cuddle	**Benches:** Weathering patterns, the interaction of man-made surfaces with the elements;	**Benches:** Near proximity to a teacher. Reading picture books, play and observation.

children too.	slippery, dry, cracking, lichen-covered, cold, wet, warm.	
Pergola: Transitional architecture between the building and the outside. we can regard the climbing plants as our ceiling, the timer supports as our walls.	**Pergola:** Play of light and shadow on the ground. Contrast of chaotic growing vegetation and man-formed natural material.	**Pergola:** Sitting, reading, communicating with teacher. Moving through on small vehicles. Shelter from climatic extremes.
Weather station: We encourage you to record and measure the weather patterns (rainfall, wind, and temperature), scientifically too.	**Weather station:** Discovering the differences in measured weather properties, and perceived weather properties.	**Weather station:** Measuring, learning numbers, sharpening judgement of weather situation.
Tunnel: Children are capable of building structures. The experience of spatial transition and to be hidden from view is valuable.	**Tunnel:** The physical needs of the child and of the plant are symbiotic. The shifting pattern of shadows on the ground acts as an unofficial sundial.	**Tunnel:** Building willow structures, and transforming natural material into architecture. Unconscious perception of the wandering of the sun. Movement through, and hiding in the tunnel.
Stream-bed: We facilitate the experience of water in its many facets. This place allows for creative redesign and adaptation of the physical environment. Keeping dry and clean are less important than the interaction with water, stone, sand, twigs and branches. The path taken by the water	**Stream-bed:** Tactile experience; sand, concrete and stones in varying degrees of wetness, texture, or temperature. Force of water in breaking dams, eroding sculptures, sweeping away leaves.	**Stream-bed:** Building dams to contain water until the next rainfall, gauging climate intuitively as a result of interaction with the water system. Moving stones, sand and small boulders. Building an understanding of drainage patterns.

is easy to follow, from the roof to the cistern, to the pump and concrete stream, to the absorbent sandpit.		
Bridge: This has been scaled to the child's use.	**Bridge:** Sound of water rushing beneath, and children running over	**Bridge:** Movement, prop for imaginative games and for observation of the water flow.
Water pump: Drinking water is precious; we want you to learn to take responsibility for your use of it. We consider water an essential ingredient of play.	**Water pump:** Exertion required to pump out water. Sound of gushing water. Sound signs to recognise relative fullness or emptiness of cistern.	**Water pump:** Equating rainfall patterns and play use of water. Evaluating relative importance of each sand-building project. Co-operation, communication and decision-making between she who pumps and he who uses the water
Sand-pit: We provide you with a large space for this kind of creative free play.	**Sand-pit:** Sand offers the experience of varying properties of one material when mixed with another. (Sand with water).	**Sand-pit:** Building, forming, role playing (baking, shop-keeping etc.), throwing, mixing dry sand with wet sand – observation of phenomena of mixing materials and the effect of climatic factors.
Balancing posts: The hopping distances and the height of the balancing posts are set to a height which poses a challenge, but which will not render serious	**Balancing posts:** Texture of wood on feet and hands. No coded messages of movement direction.	**Balancing posts:** Jumping, judging distance and height differences. Experimenting with speed of movement and balance.

injury if you fall. We encourage you to become familiar with the physical limits of your body.

One example from the table is described in greater detail below:

The Recumbent Tree

The tree was felled in a nearby forest and transported to the kindergarten complete with roots. The trunk (0ak) was sawn off just below the branches, with a length of>4m.This was carried out by the US army, (who have an army base nearby) as a donation to the community. The tree was then set in position so that no rolling could occur. No further treatment of the tree occurred. The children use this tree for diverse play, for climbing, balancing on, as an observation point, and as a 'prop' in role-playing.

FIGURE 123 RECUMBENT TREE

For example:

A three-year-old child climbing on this tree feels the texture of the bark. She estimates how slippery the surface will be to her grip, and pulls herself up with the necessary effort. Sometimes this takes several tries. After a while, she can slip off and on with less effort. She begins to explore; how long is this log, how can I move across it? Can I crawl, is it safer for me to stand up and walk? She moves along the log, sideways, carefully inching herself towards the far end. The kindergarten teacher observes from her viewpoint, sitting

on a bench - a young boy sits next to her, he is busy with some sticks. The teacher watches, says nothing until, the girl on the tree waves; she has found her balance and stands triumphantly at the root end of the stump.

Some other children move to the recumbent tree, they want to fly to the moon. They climb aboard; all sit in a row. The pilot grabs hold of one of the roots, his co-pilot holds onto another, they take off!

Later, some children seem to be telling each other a story; they approach the roots, and place something in one of the natural cavities, which the eroding rain has formed from the clay soil still clinging to the roots.[32]

From this description we can see the diversity of action and experience afforded by one single element. The tree is simply a tree trunk, lying on the ground; the children are free to 'take it over' and infuse it with their own imagination.[33] The tree fulfils its function as a stimulus, offering endless possibilities.

Active Learning Experiences: Analysis

The 'prepared environment' about which Rebeca Wild writes is evident in the diversity of experience proffered by the kindergarten design. Just as children are diverse in their interests and character, so is the environment.[34] *...unless due account is taken of the effect of the environment on children's behaviour, the root cause of many of the problems will not be recognised*[35], the kindergarten teachers were eager to point this out. The richness provided within the spatial and vegetative structure and the free choice among this diversity of experience becomes a tool for the teachers to monitor personal development within the children users. Depending on where the child directs her interest,

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[32] Taken from an interview with Frau Lambrecht and Norbert Schäfer in June 1998

[33] This is what Pierce referred to as viewing the world creatively, rather than passively. It is the ability to project the internal workings of the mind on to a suitable object, which can be used to play-out that which has concerned us

[34] Mauricio Wild (Pestalozzi School Ecuador) uses the metaphor of the structure of the cell DNA, which determines what substances are chosen to be absorbed by the cell, internally structures the cell. A child also has its own internal structure, which it must satisfy in order to remain healthy and grow. Conference Children and Boundaries Organised by Mit Kindern Wachsen Berlin 1998

to the water pump, to the fireplace etc. the teachers can observe change, development and repeating patterns of behaviour. A natural 'feedback' system operates, when a teacher is free to observe the activity of a child, and the child feels un-threatened by intervention. The teacher can reflect on the suitability of his current approach to the child and, guided by his observations, adjust them for the future. In this way, observation and preparation of the environment becomes the pedagogical tool, rather than direction of the child's activity.

FIGURE 124 SENSORY PATH

FIGURE 125 BALANCING POSTS

If the kindergarten supports the formation of sustainable values, it could also possess a mechanism, which can neutralise those influences, which are operating contrary to sustainable thought, stemming from society. David Chilton Pearce points out the detrimental effect of television consumption by children, particularly in the pre-operative phase before the age of seven. (Such as long hours spent watching television and the subsequent lack of muscle tone, social communication skills and overloading of under-processed information)[36]. The active environment of the kindergarten is designed to

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[35] Taken from Titman, W, Special Places, Special People. The Hidden Curriculum of School Grounds. Learning Through Landscapes/WWF 1994 ISBN 094761348 The book is based on an analysis of environments specially designed for use by children

[36] Pearce 1997 Chapter 2 See, Toffler, A. Future Shock.1971 For his predictions as to the effect on societal cohesion. Also, Rebeca Wild, David Elkind, WELEDA Quarterly , June 1996. for their references on the effect of television viewing on children.

counter-act some of these detrimental effects; the children release through physical activity much of the bound-up tensions of indoor-orientated urban life.

Most educators, if asked why actions by children are important to their environmental learning, will answer that such direct experiences are necessary for their understanding[37].

The work of Maria Montessori is grounded on the principle that understanding of a subject can be achieved through direct and active involvement with it[38]. The Wilds have taken on this work in the Pestalozzi Schools among others.[39] Roger Hart, a professor of environmental psychology at the graduate school of the City University of New York has written, *There is considerable theoretical reason for believing that concern for the environment is based on an affection for it, and this can only come from autonomous or unmediated contact with it.*[40]

The kindergarten planners, Norbert Schäfer of Stadt+Natur writing, support this contact theory; *I learn about myself and the world by acting in it. Through action, I learn about the individual natures of that which surrounds me, I learn to recognise structures, associations, processes- discover possibilities of use and development, see the potential for change.*[41] The elements explored in the table above indicate the wide range of activity, which is offered to the Hütschenhausen children and the accompanying pedagogical stance taken by the educators.

The Formation of Personal Responsibility

The diversity of potential experience offered by this design means that a child is freed from the manipulative confines of less rich environments, and is given the (cognitive)

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[37] See page 246 of the above.
[38] See Montessori, Maria. Kinder Sind Anders 1926
[39] See Wild Rebeca Education For Being (Erziehung zum Sein) 1991
[40] See the Hart, Environment for Children 1996 Page 246
[41] Norbert Schäfer of STADT+NATUR. Spiel Raum und Freizeitwert. Publication. Hanne Strong, president of the Manitou Foundation, confirms Feb. 1996 This opinion. See article reference footnote number 8

space to choose freely according to her inner structure.[42]Those experiences learned within an environment of free choice, and appropriate danger, lead to the formation of personal constructs, which empower the individual. Positive experiences build up over time (the overcoming of fear by mastering balance while walking along the trunk of a fallen tree...[43]), and with it confidence to face future difficulties, and overcome them.[44].

The following two examples illustrate this potential to learn behaviour of responsibility by interacting in an active manner with this environment:

The Water Example

Since installing the cistern in the kindergarten, the children's use of the resource, water has become more responsible. In an interview with Frau Lambrecht, she explained how the children no longer leave the taps running in the bathrooms, and take great precaution to conserve their water. Through the experience of the pump and the underground cistern, they have become first subconsciously, then consciously aware of the value of water, which, despite the tap and the main water pressure, is a resource to be conserved. *Explanations concerning the connection between rain and playing with water are superfluous. Dams are built in the stream in order to store the water already pumped, until it finally rains again.*[45]**Although the children know that the water issuing from their taps is not the same as that which is stored in their cistern, they have given an automatic collective value to this resource.** This development was one of the major surprises of the planning of the kindergarten. What the children used and acted on in the external environment in an operative mode of learning, was carried over in to the kindergarten internal environment in a connotative manner. **The children were able to transform the evidence from one set of experience, into another setting. It is this ability, which**

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[42] This "attention to children's needs" was formulated as a deficit in most planning for children. Aaron, D. and Winawer, B. Child's Play: A Creative Approach to Play-scapes for Today's Children 1965 Harper and Row.

[43] Rebeca Wild writes of in her experiences from' Pesta' in: Education for Being.

[44] Elizabeth Gründler, journalist, reports this phenomena in her observations of children in the Hütschenhausen Kindergarten. In Spielen und Lernen 4/97

[45] Lecture. Lambrecht 1998

creates a human who is able to take responsibility for his actions – and without any force, or manipulation from outside. The child interacts with the prepared environment.

The Fire Example

Fire is an element not usually associated with children's play. The German Fire Department however is of the opinion that early experience of fire is necessary for the child's future well being. They argue, that if a child has experienced fire in a controlled manner, being able to approach it with caution, feel the heat generated, and see the power of burning, then the child will be able to act with more responsibility should occasion arise when no adult is present.

The Hütschenhausen Kindergarten has integrated fire into the seasonal activities. Children regularly come in contact with fire, with the attendance of adults. The respect for this element, which they acquire through active experience then, carries through into the inside of the kindergarten. Bonfires are burned; dough and baked potatoes, picked from local farmers are roasted. When a child celebrates her birthday, she is allowed to light the candles. She must be just as careful with a match as with a flaming stick outside. The dimensions and power of a match are more proportioned to the child's ability. Observing the flames of a bonfire equips her to encounter the burning flame of a match.

The degree of success enjoyed by such a rich environment is dependent on the educational curriculum guiding the activity. The Hütschenhausen kindergarten is successful because of the double-acting effect of physical and social environment. The children are free to add their own layer of understanding to the experiential process without having unsolicited explanations inflicted upon them. This creation of their own mental constructs is based on their very personal choice of interactive experience.

The children combine these three aspects to synthesise their own mythologies in the *recumbent tree* example. The child who leaves a small offering token within the roots of the

fallen tree, for the *tree fairies* **has encountered the freedom to create his own understanding of the environmental systems operating around him. This is his attempt to explain the living quality of change and dynamism, which he experiences in his daily contact with the environment.** Through active use, an understanding develops; this is akin to the intuitive sense of the qualities of stone which stonemasons develop through repeated handling of the material in varied conditions. **It is in this subtle dialogue with the elements of the environment that his attachment of caring begins.**

Preliminary Conclusions

Reading the Environment as Text:

Coded Messages in the Prepared Environment

The coded messages within the Hütschenhausen environment have been formed as the result of the study of and response to the actual developmental needs of children. This definition of the needs of children has formed the foundation for the work of the planning office of Stadt+Natur, and necessarily, the teaching body of the kindergarten, both of whom referred to the work of Piaget and the pioneering work of the Wilds in the Pestalozzi Schools.

The perceptual transmitters provided by the planners in their construction of the playground, were understood by the teaching body, who recognised a 'fit' with their own receptors, developed during childhood experience. What Stadt+Natur provided was a means of giving form to the body of experience, which these teachers themselves had enjoyed. As the principle herself said, *children are no longer allowed to roam the streets, fields or woods as she once was, indeed, many of these resources no longer exist.* Norbert Schäfer pointed out that many of the teachers now practising were themselves denied vital experiences in the natural environment. This renders their task of providing adequate environments for children's play more difficult.

The playground was developed as a replacement microcosm of all that was no longer available to the children in the greater environment, either through changes in social

expectations[46] or through the change in land use and access to resources which were once readily available.

Un-coded Messages in the Prepared Environment

The *un-coded messages* are naturally created phenomena (such as the colour change of a leaf from yellow-green in spring, deep-green in summer, and orange-red in autumn which signals the passing of the seasons, expressing the natural cycles in nature.). These have also been chosen consciously to contribute to the prepared environment. The choice between planting evergreen shrubs and mixed deciduous shrubs has an immense impact on the available diversity of potential experience. The first group retains a stability of form and colour throughout the year, the second changes through the seasons. The degree of environmental manipulation available to the children is as important as the palette of natural elements populating the environment. Stadt+Natur have already produced literature discussing the richness and diversity they deem necessary for children's learning environments.

Active Experience: the possibility and the development of the child's potential to experience the environment actively.

Looking at the Hütschenhausen Kindergarten as an example of PEC

- The three main tenets of the PEC program are:
- Sustainable use and management of the environment and natural resources.
- Meeting livelihood and health needs.
- Empowering local groups or communities for self-directed development.

These were devised as a result of the formulation of sustainable development contained in the Agenda 21 of the United Nations. This evaluates to what extent the Hütschenhausen kindergarten satisfied these objectives, in order to qualify as an example

[46] For example, the acknowledgement of latent danger in the form of child abuse, kidnaps or attack which the parents feared.

of sustainable planning. To do this, the author makes the comparison to the articles of Agenda 21, which pertain to the planning, building and use of the kindergarten. The main conclusions are presented here, the rest being contained in the Appendix 2. The analysis according to the articles renders the comparison between case studies more fluid.

- The planners showed how, with little money, a diverse, ecologically rich environment could be created using natural materials and recycled materials: willow and household objects could be turned into play structures.
- The kindergarten grounds are almost self-sustaining. The *toys* grow in the environment. Due to natural compost fertilizer, the system is closed. The children learn to use less water indoors, they do not require so many manufactured articles, and the waste they produce is recycled.
- Active participation in the building and maintenance of the kindergarten caused a large number of people to come into contact with the natural environment.
- Much of the original diversity of the native climax vegetation and ecology was reclaimed and improvements were made to the water balance.
- The children's experience of the limited nature of the water supply lead them to value ground water.
- The participative building method and maintenance acts like a training scheme for environmental awareness.
- The children see the consequences of their management practices.
- The effect spread to the kindergarten parents, who decided to alter their private gardens having experienced the benefit of the kindergarten grounds.
- The diversity of the environment ensures a natural distribution of use and wear which is sustainable.
- The use of water from the pump and cistern may at first appear to be wasteful, but the experience of using the water as we have seen has lead to a sustainable use of the

water from the pump and elsewhere. The water captured in the cistern can be seen as a kind of investment policy to ensure the future responsible use of the resource.

- Active learning equips the children with first-hand knowledge of a variety of natural processes. The child develops an emotional affinity based on operative learning. This lays the foundation for future detailed study of the systems of ecology.

Chapter 8

Case Study Analysis

Analysing the Children's Learning Experience: Developing Values

Introduction

The following additional chapters of eight and nine serve to deepen the research into the issue of the action of children in the environment. The author is keen to present this work, which combines the awareness for planning and education. This field of research is just beginning to develop in Germany, Britain and in the USA. By focusing on learning opportunities which children embark upon without the active direction of an adult, more can be learned about the psychology of the child and about the appropriate nature of environments, which are designed for children's use. The greater the children's exposure to differing experiences, the more influence will the experience have over the value development of the child.

This chapter explores the way in which the children of the case studies 'self-taught' themselves values; much of this teaching depending on the quality of the physical environment to which they are exposed, or choose to expose themselves to.

The author has demonstrated how children develop a special relationship to their environment, often with very different perceptive perspectives than our own. The children in the Hütschenhausen Kindergarten developed a relationship based on their daily sensual experiences with elements of earth, water, fire and air. The water story illustrates how the children's knowledge of their environment has deepened through experiential contact.

Exploring a Theme from the Analysis: The Water Story

Introduction: A History of Water

The following text looks briefly at the role held by water; functionally and symbolically since ancient times: In ancient Egypt where the *earliest recorded gardens*[1] were found, water was central. *Water, without which there could be neither fruit nor flowers nor the shade of trees, became the central motif of the garden, both by necessity and symbolically, as representing the river of life.* Tracing this symbol through history; *this motive of water as the fount of fertility developed all the Asian gardens of irrigation, including the Arabian, the Persian and the Mughul gardens of Northern India. Its influence reached far into the Western world, in classical times through Greek and Roman conquests, in medieval Europe through returning crusaders, and finally, in a purer form, entering Spain with the Moorish invaders.* Perhaps the example of the use of water in the Persian gardens is the most accessible to our ears; we have long been exposed to the image of the paradise garden, *through the design of the Persian carpet. Here the pattern of irrigation takes the form of canals representing the four rivers of paradise and forming a cross in the centre.*[2]. In each of these examples, water has been used as a resource; it has served the function of cooling hot bodies, of irrigating plants grown for food, for aesthetic pleasure, as a reflective surface, as a means of tempering a hot climate, as a place of storage, for use in cooking, cleaning and other activities. The value given to this water has however encompassed all that and more. Gibson, who shares a similar view to Liedloff, put this succinctly; *From the perspective of a Western worldview, it may appear that the purpose of natural resource exploitation is to secure social and economic well being. However, resource exploitation in the context of indigenous and non-indigenous society is fundamentally different because such activities take place within completely different conceptual and cultural frameworks. Gitskan and Wet'suwet'en world views* (for example)

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[1] Sylvia Crowe. Garden Design 1981 Packard Publishing Ltd. Page 14
[2] Quotations taken from Crowe, pages 14 - 15

evolved without Greek atomism, Aristotelian logic, Cartesian thinking and the French Revolution, which have played a significant role in shaping the sociocultural value systems and conceptual frameworks of so-called Western Society.[3].

Wilson and Kellert's *Biophilia Hypothesis*[4] is based on the statement that there is, a *human dependence on nature that extends far beyond the simple issue of material and physical sustenance to encompass as well the human craving for aesthetic, intellectual, cognitive and even spiritual meaning and satisfaction.* It is this craving, which is evident in the children's enjoyment and use of the water in their play.

Water used in the Hütschenhausen Kindergarten

The children of the Hütschenhausen Kindergarten use water in their daily play. No one tells them what to do with their resource, it is entirely up to them how they operate the pump, if they choose to build a dam to retain much of the water for a later date or if they splurge the entire content of the cistern in one day. Whatever the decision, it is the children who witness the consequences of their actions.

What this self-determination achieves is allowing the child the right to develop her own values. This does not presume a vindication of responsibility on the part of the adults. The have prepared the environment. In doing this they have pre-set the limits to experience, ruling out situations which would pose as a serious hazard to the well being of the child. The freedom of action engaged in by the Hütschenhausen children cannot be labelled 'anti-authoritarian'. The author considers the consequences of this, without being saddled by the weight of anti-authoritarian critic.

Initially, the children enjoyed water for its sensual qualities, the mixture of sand and water, earth and water, experiencing its flow and movement. The resistance properties of water

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[3] Quotation from Gibson, 1972, in article: Spiritual Stewardship in Aboriginal Resource Management Systems. By Mary Ellen Tyler. Environments 1994

[4] Wilson, O. and Kellert, S. The Biophilia Hypothesis. Harvard University Press 1984. Page 1

were experienced, the potential for supporting structures, the pattern of movement taken by water flowing from high to low, the speed of absorption into the sand etc. etc. These experiences collect within the memory of the child to form her own mental construct of water.

An additional layer to the water experience is that where the child internally assigns a value to the properties of water. This is achieved through the experience, and the interpretation of this experience, and occurs through operative learning in the manipulation of the materials of water, pump, sand etc.

Water is pumped from the cistern which had collected during rainfall from the roof of the church, and is pumped out by arrangement (spoken or unspoken) among the children to form the basis of a daily greeting of sand, water and busy forming hands.

This operative learning is accompanied by figurative learning in the form of play rituals many of which, has their origin in the adult culture which the child is naturally trying to grasp. These are mimetic. The experience of water is later transformed through reflection or connotative learning, into a held value. The children have, *perceived the value of food,* (water) *mediated through ritual rather than experiencing the need for food* (water)[5]. In this case the ritual of the child is their play.[6] The water is integral to the ritual of play, and its value can be assessed according to the availability of water for this play. In this case, the very scarcity of water is that which has generated the value. This will be explained in more detail below. The Hütschenhausen children are like any other group of children in the industrialised nations; they lead a comfortable life, sheltered from the elements, adequately supplied with material goods and mental explanations. Their sheltered up bringing had however denied them sufficient self-directed experience. Society can tell all the myths we like (and this is much the role of the tradition of environmental education

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[5] Extract from letter from Dr, Faozi Ujam to Mariam Reinecke in a discussion on values and the needs of people. October 1994 The example referred to the experience of food in native African societies.

[6] See Wulf's paper on Mimetics and ritual. Developing a Social Sense 1995 and Montessori's comments on the child's play as her work. (Children are different and other publications.)

programmes in many schools), but, without the direct experience we can never build this into our cognitive map.

The Value of Water

In the past, values have been passed on through shared collective experience, where the same rituals were repeated in the knowledge that their importance lay in indisputable facts based on the nature of their relationship to their originating source. Liedloff argued that children required additional basic physical experiences. Knowing the importance of water for the very perpetuation of life, water was revered. This reverence was expressed in the form taken by the inhabited environment. Water was inseparable from any exchange on the material level. In every action of washing, of bathing, of cooking, or irrigating, the society would be reminded of the precious nature of this resource. In a hot country, evaporation, high temperatures and limited rainfall contribute to the value given to water. Those creators of the Persian garden were living the reminder of their value. Everyday they could experience the confirmation of their paradise myth.

What occurs when, water becomes available as a steady supply through the tap in the wall? Supply is apparently limitless; little effort of thought or bodily exertion need be applied. No longer does everyone concern oneself with the dilemma of ensuring the purity or the adequacy of supply. The need, which once generated the value, has disappeared from daily lives, and water need only be experienced in the pleasurable aesthetic and utilitarian facility. With the disappearance of this relationship of value, the myth of water is relegated to the role of an empty vessel, devoid of any relation to reality. Maturana and Varela termed this a tradition – that is, when a cultural phenomenon no longer *require(s) reflection to be generated....Tradition consists of all those behaviours that in the history of a social system have become obvious, regular and acceptable. Since they do not require*

reflection to be generated, they are invisible unless they fail.[7]Prior to tapped water, there was constant reflection on the value of water – 'will the well freeze in winter, dry out in summer?' etc. Maturana and Varela describe tradition as a force similar in power to that possessed by a value. The parallel of reflection and daily experiential involvement is useful. When the tap water supply fails or is contaminated, then we begin to question our value placed on water[8].

The Purpose of the Myth: How the Hütschenhausen Children Formed their Values

Returning to the Persian paradise gardens and carpets, part of the myth, which has been woven about the creation tale, and the four rivers of paradise may have served the reflective purpose, which ensures awareness of the resource. It could be argued that myth was used to bolster the reflective process of value perception; **stories were insurance policies for maintaining an awareness of the important things in life.**[9]Had the Hütschenhausen children simply been told that, *water is precious, please use it carefully*!, had they been daily arrested with posters above the wash basins warning them to turn off the taps, the result would probably have been similar to that of any other 'educational premise'. Some would have obeyed the commands, and others would have not. There would have been no reason to develop a real understanding of the value of water conservation. The Hütschenhausen children have however internalised their experience of the cistern and pump, to create a 'myth' of the restricted supply of water. This they have subsequently applied to all water supplies available to them. **The water pump could be said to act as a means for the children to create their own explanatory mythology about the availability of water.** Through this myth, the children have created their own construct.

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[7] Maturana and Varela 1992 Page 242

[8] An amusing anecdote on this theme is to be found reading the German illustrator, Janosch's book on Emil Green Bear, where animal characters save helpless humans from their perplexing problem of poisoned water...

[9] Danesi and Perron present several opinions of the function of myth, which can be read on pages 256-259 of Analyzing Cultures An introduction and handbook. Indiana University Press 1999

The expansion to the Maturana/Varela Model created by the author in Chapter 3 is applied to the analysis of the Hütschenhausen Kindergarten in this chapter. The model explains the hypothesis of the development processes occurring when a child acts within an environment.

Comparative Analysis Between the Case Studies

The Water Value Formation:

The analysis of the water pump example was conducted in a manner befitting Steward's theory. The analysis involved close study of the use of a natural resource, and the conclusions formed by the children as to the property or worth of water as a result of their interaction. The water example would be a prime case study were Steward to investigate the culture of the Hütschenhausen Kindergarten.

Here is a similar system at work; that of homeostasis, via biofeedback with the potential for all the trappings of cytological exchanges mechanisms. The scale of operation is larger however, this time we could be analysing the Hütschenhausen kindergarten as a unit, or any one of the Weimar schools. Considering the planning and building phases of the kindergarten, and the influence, which these actions worked on the larger community, then an extension of the value analysis could be made to the wider social community of Hütschenhausen. The author has described the formation of a value for water – how far would the influence of this formed value extend within the wider community? This has wide-ranging implications for sustainable development. If it can be shown that such interaction leads to the formation of sustainable values, then these projects can be used to encourage sustainable development. The changes to the site of a kindergarten facilitated by the accompanying social environment, (teaching practices and participatory activity), could be the seed in the bed of change in the dominantly held values of this community.

The writers of Agenda 21, never ceased to point out the importance of education in the establishment process of the sustainability ethic. They do not define what kind of education is encouraged; it could be environmental education taught in the formal figurative manner in schools, or universities, or the result of direct, hands-on participatory experience, as Hart proposed. The author proposes, that the evidence shown here favour the last type of education. Are there other germinating seeds of value systems which the Hütschenhausen children have played with? Is there a dimension of perception engaged in by the child, which enables him to perceive his natural environment as an interactive system of living entities? Is there a link to be formed between the rituals, traditions and myth of those cultures who have maintained their connection of communication with the natural environment (such as the Hopi, or the Wet'su'wet'an people of Gitskan for example) and the operations of the children in their environment?

Answering these questions is beyond the scope of this study. The author wishes to include them as possible avenues for future research. Raising the questions is a step towards understanding the process of relation between humans and the physical environment.

The Environment as Text:

The lists of coded and un-coded texts in the analysis of the Hütschenhausen Kindergarten illustrate the richness and diversity of experience available in that play environment. This was not restricted to the physical plane. The coded texts available for the children attending the kindergarten covered a range of expectations regarding their behaviour, physical abilities, exertion of responsibility, as well as codes of usage for the grounds and the degree of participation allowed in planning, building and realising the structure of the environment. Compared to the scale of the housing estate of Weimar Nord, where children had to often traverse large distances before they were challenged by anything more stimulating than large planes of lawn, the Hütschenhausen Kindergarten is a paradise of potential fields of experience.

In the case of the Hütschenhausen kindergarten, adults (planners, teachers and parents) have deliberately structured the environment, within the defined borders of safety and responsibility, to allow for the widest possible response range.

Another example of this kind of hostility was the reaction of the majority of the girls from the Rathenau School on being confronted with litter. The tree house and deserted house of which the boys were so proud appeared to these girls as something foreign, to be avoided and to which they had assigned a negative connotation. The transmitters did not fulfil their expectations of pleasant aesthetic experience.

Placating Needs in an Hostile Environment

The children complained of 'teenager's' bad behaviour, destroying the wire netting, which allowed their footballs to get lost, or stuck. On discussing the possible motivation of these teenagers, the children suggested that there was no appropriate place for the teenagers on the Weimar Nord Estate. The playgrounds, they defined, belonged to the smaller children. They reasoned that the teenagers were cross at their inadequate situation, seeking challenges, they chose to climb the fence, and rip holes in it in the process. Titman recognised that, *design and nature of schools (buildings and grounds) actually contributes to and causes problems in terms of damage and vandalism, not only by the very nature of the design but also because of the messages and meanings which design conveys to users.*[10] Again, the children showed the marvellous ability to interpret both action and the motivation behind it. They had accurately pinpointed the unsatisfied needs of these teenagers. Environments are often acknowledged as suitable for school children,

[10] Titman, Wendy. 1994 Page 113

but inappropriate for older teenagers, who, by default, show they possessed another set of needs to those of their younger peers.[11]

This problem has often been discussed in urban districts where money is available for only one playground. The question least posed, is how this satisfies the needs of all age groups (waiting parents included)[12]

Another example could be seen in the traditional school system: Weimar Nord's Cranach School required the children to remain seated at all times behind their desks, from the age of six onwards. The timetable of the classes was highly structured and the children had no influence in the construction of their day. This teaching methodology could provisionally be registered as a '3' on Hart's Ladder of Participation.[13] On being asked to express their needs (in the drawings for the alteration of the playground chosen by the children), these children reeled off a list of play attractions, bright, shiny plastic, metal and wood, chosen from amusement parks, shopping centres and fast-food restaurant car-parks. The brightness and powers of attraction exuded by these environments have been designed to dazzle the child into forgetting, for example, that he is missing his mother who has been shopping now for an hour, or that he is supposed to keep out of the way of his parents who have finally created a chance to talk with each other in the restaurant with the best-equipped playground. These playgrounds are, as the Cranach School children recognised, 'fun' but have been created as distraction rather than as an answer to a real need.

The Cranach children are filled with the experience of environments constantly not living up to their expectations created by their internal needs (an excellent example of this is the manner in which these children chose to portray their houses. Instead of portraying the

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[11] Visiting the area three years later, the author was surprised to find a fence playground construction for teenagers, built by the town, which came close to the children's proposals.

[12] This issue was the subject of interesting debate in the talk given by Gunther Belzig, a play designer who works throughout Germany. He and other members of the audience, highlighted the deficit in this area. Spielraum Congress May 1998. Hannover

[13] See page34 for the rest of Hart's Ladder of Participation Page 7. those projects where children seem to have a voice, but in fact have little or no choice in the subject and no time to formulate their own opinions. This is a common stage engaged in by adults who are just beginning to be aware of the need for real participation. The role of the child is little more than symbolic however.

dull grey reality of Soviet-constructed high-rise blocks of flats, many of the children embellished the uniform facades with exotic curtain treatments at the windows, highly individualised doorways, paying particular care to house numbers and generally heightening the colour and diversity of an otherwise plain environment.) The manner in which these children chose to depict their home environment is far removed from the objective reality of the place. They have chosen to project creatively their perception of an ideal, and in so doing highlighted the enormous gap between their expectation and the reality. Believing the thesis of Jesper Juul,[14] that children's only wish is to express their needs to parents, and figures of authority, the children's ability to express these unfulfilled needs so eloquently in their drawings can be admired especially where experience has rendered them wary of expressing their thoughts in words.

The decorated high-rise buildings indicate the children's need for an environment not governed by predictability, but filled with diversity. The decoration also suggests the child's longing for territorial definition, for creating a sense of 'belonging'[15]. What they have presented is drawn from their available vocabulary of mental constructs. These 'fast-food' play structures symbolise their internal need for diversity, challenge, inventiveness, and confrontation. Sadly, their collective experience has been gathered from 'half-truths', we have already shown the motivations, which commissioned the construction of these playgrounds: Firstly, the playgrounds were built to attract the adults; bright plastic lulls the parents into the false sense of security that their child will be happy there. The restaurant wants nothing more than lucrative customers, families bringing in several consumers at one swoop. It 'pays' to install giant coloured Ronald slides... The children denied of experience with real content, grasp hold of the next best, 'alias' to express their needs.

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[14] Juul, Jesper, the Scandinavian family therapist, principle of The Kempler Institute of Scandinavia since 1979 and author of, Das Kompetente Kind. (The Competent Child) Auf dem Weg zu einer neuen Wertgrundlage für die ganze Familie. Rowohlt. 1997 ISBN 3 498 03330 1

[15] This concept of belonging has been discussed in Relph's Place and Placelessness among others.

Constructing the Prepared Environment:

Developing a Set of Variables

The following section applies three categories to analyse the Weimar School children's motivations for their choices of place. To varying degrees, the children craved stimulants or consolations for their needs in their choice of environment.

Making sense of Place – relating to the qualities of the physical environment and the child's understanding of her place within that.

Personal active involvement in a place –the sense of empowerment, relating to predilections of the environment and the internal cognitive structures

Child/Nature Affinity – the relation of the child to nature, as a culturally inherited value.

These three motivational categories were defined and organised bearing in mind the list of needs, Kaplan's work on place preference, and Kals, Montado, and Schumacher's work on developing emotional affinity to the physical environment described in chapter 4. Eight variables for qualifying place, and eight for defining the child's affinity to the natural environment were re-applied as analytical tools to a smaller representative selection of drawings from the Weimar school children. This enabled the more detailed analysis of the children's preferences, their motivations for these choices and the needs, which were fulfilled by them.

These were defined and developed from recurring examples within the drawing texts. As such, the variables themselves This synthesis of Kaplan's four factors and the analysis form the eight variables:

Making sense of Place

COHERENCE

PROXIMITY

ROOTEDNESS

PREDICTABILITY / MYSTERY

SECURITY (LEGIBILITY)

Personal active involvement

CHALLENGE Triggers for experience

INVENTIVENESS: Creative activity, problem solving, and abstraction

NURTURE and the maintained environment.

The parameters for analysis are as follows:

COHERENCE

See Kaplan's definition in Chapter 4.

PROXIMITY

This is close to *rootedness*, but addresses the actual proximity between a preferred environment and the motivator for preference: in most cases, another human. Many children selected places due to close proximity to their grandparent's house, this increased feelings of security. Children preferred to be near to the emotional support of their family even if this meant making compromises on other qualities of the environment. This conservative approach of the children is surely indicative of the general hostility perceived by children in the greater environment. It is also indicative of the need for children to have some familiar contact in a cultural milieu where it is now acceptable for a child to wait outside, on their own at home, or in an after-school activity centre until the parents arrive home from their working day.

Proximity does not however imply reliance on the adult world. All of the children described their wish for autonomy by avoiding the portrayal of adults in their drawings. Proximity refers to the security that adults are present *should the children need them*, otherwise, the children are free to develop their own play their own rules and organise their own space.

ROOTEDNESS

Rootedness concerns itself with an emotional attachment to a place, illustrating certain categories of emotional affinity. It manifests itself in two main forms: one is the attachment

to a place because of the relation of that place to another loved person or animal. The second is the sense of ownership, which is either built up over time through frequent use of a place, or through the knowledge of the place, 'belonging' to oneself.

Rootedness is revealed in the sense of pride, which is projected in many of the children's drawings (the large number signs, self-portraits, and exaggeration for example). When a child defines a place as, 'mine', or, 'ours' we can measure a level of emotional attachment. Attachment incurred through the relationship of a place to another human being can appear most illogical as a preference to our adult eyes. (The Cranach School child who chose a vast, empty flat monoculture of grass for his favoured place is a good example of this. He related the place to precious memories of family togetherness – an indication of his most pressing need.)

In the children's drawings, rootedness was illustrated wherever the child had brought herself into the picture. Where a child had drawn something requiring maintenance by himself (such as rabbits, or vegetable plots) this implied a long-term relationship, or personal contract of involvement between the child and the place.

The second category of 'ownership' is important for some children as an indication of their self worth. *A home, whether a crude hut or an elaborate mansion, ... is felt to be an extension of the body's protective armour.*[16] Those Weimar children who were aware of their parents' ownership of the land on which they lived were eager to manifest this. In these cases, the pictures were arranged about this fact, as the central issue determining the picture.

This sense of what belonged to the children was highly developed. In places occupied by more than one group of children, the children would undertake only scant renovations on previously built structures. They did not perceive full ownership (such as the tree houses). Danesi and Perron's semiotic analysis of the built environment also points to this issue of

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[16] Danesi, Marcel and Perron, Paul. Analyzing Cultures. An introduction and handbook. Indiana University Press 1999. Page 196

ownership. *When people cannot procure a personalised space, as in public housing projects....., it should come as no surprise to find that they tend to lose respect for their place and even for themselves, thus engaging in defacement and vandalism.* [17]The wide range of chosen places would seem to indicate that the children went to great efforts to find small niche environments which they could claim as their own.

PREDICTABILITY (MYSTERY)

See the definition according to Kaplan in Chapter 4.

There is a fine line to be drawn between unpredictability and mystery. The first leads to discovery, but surrounded by an aura of fear. Mystery leads to discovery, but with sufficient hints at what will be discovered to reduce the surprise.

Kaplan alludes to the physical properties of space, the children however perceive myriad other details: textual mystery for example. Here the eye detects a surface, which appears three-dimensionally attractive; the source has to be explored in a tactile manner, which may lead to new discovery. Softness, hardness, unpredictable changes in level and uneven paving can be as inviting as curving paths which beckon the child with the promise of something around the corner.

SECURITY (LEGIBILITY)

Indicators of security can be purely physical. The children have shown however that there is more to perceived safety than spatial or textural layout. Many of the children were aware of the possible threat to their play, in the form of free-roaming dogs, disturbing adults or aggressive teenagers. Much of their design had defensive elements to contradict this. Security was therefore often perceived in terms of the ability to defend – an active affordance. Clearly defined borders increase the legibility of a place. This was brought up many times by the children, revealed through their reaction of pleasure or displeasure to a

[17] Danesi and Perron. 1999 Page 197

place, or through the specific suggestions to alter their chosen places. (The black boarding around the Weimar Nord sandpit is a good example.)

Security included the ability to play unseen. Children have a keen eye for seeking out such corners, and as such this is indicative of a great need to exercise their own autonomy. Designing hiding places is like walking along the razor's edge; on one hand, the children perceived security when free from the prying eyes of adult strangers, but, without adult surveillance, children are at prey to the other users of the place. Security cannot simply be achieved through physical planning, particularly where the real threat is perceived to come from the social sphere.

Indicators for safety include: The cleanliness of a place –an indicator of the maintenance, and therefore regular surveillance of a place. The presence of broken objects, or excrement. Children preferred bright colours such as in flowers, painted play equipment, or bright sunshine to the typical environmental psychological indicators of safety such as possessing a 'safe back'. Where flowers and other colour were present, the children assumed a social milieu of caring, the security of which was sufficient to annul problems created by inadequate spatial planning.

NURTURE and the maintained environment.

Nurture involves the perceived 'care' administered by the adult world for the care and protection of children, animals, plants and place. It involves also the degree to which children are prepared to interact in a nurturing manner with their environment.

Indicating factors for this emotional issue are: love of flowers in public spaces, association of place with wildlife (such as fish in ponds, birds in trees, squirrels etc.), concern for litter noticing broken or ill-maintained elements and preference for soft, intimate and sheltered spaces. These factors are associated with an ongoing relationship of the adult world caring for the physical environment.

The children's drawings show playgrounds requiring intensive maintenance. They are not questioning practicalities or budgets, simply stating what is necessary for their development. The children are willing to contribute to and care for the ponds, rabbits in their hutches, bird tables and ornate built structures. The fact that they have drawn their wishes indicates a willingness to involve themselves in their creation. The fact that these elements are never built indicates the reluctance of the adult world to act on the initiative of the children. Nurture is thus an indicator of the child's willingness to participate in the structure and maintenance of her environment.

INVENTIVENESS: Creative activity, problem solving, and abstraction

Inventiveness represents the richness of the child's imagination with regard to her physical environment. This variable describes the ability of the child to constantly re-invent himself and his environment. Inventions are achieved through: a. Combination of old and new elements, of natural and man-made, of large-scale and small scale, of adult built and child-built. b. Compromises where, inadequate structures are grandly re-combined with new, more appropriate child-designed elements. And c. Transformation, where an element is given a new function through small additions, which involves a change in the perception of how an object should be utilised. These are the grandest statements of the children, expressions of their creative selves, willing and thirsty for applying their knowledge to their environment. Inventiveness demands an environment flexible enough to accommodate this creative urge.

CHALLENGE Triggers for experience

Challenge is associated with self-confrontation, and as such, the experiences sought by the children within their chosen environments are likely to be those with which she has had no, or inadequate previous experience. (Such as discovering wet sand described at the beginning of the chapter). We can measure this variable by two indicators: Firstly, the diversity and variety of potential experience latent in the physical structure of the

environment. This is accompanied by the possibilities for engaging in experience according to the social structure of adult/child surveillance/affordance. The second involves a comparison of the chosen experience against a norm of standard daily experience. The question of social affordance is as vital as physical structure; no matter how many climbing trees exist in a playground, the trees only afford an experience of climbing when the children are supported in their action by the adults responsible. It is interesting to note that those experiences offering the greatest challenges to the Weimar school children were those where adult surveillance was guaranteed to be absent. The children had learned from judgement, praise, criticism and directives to their choice of activity, that genuine challenge was only possible in the absence of interfering adults. The real challenge is to create an environment where the child is free to express his needs and fulfil his desire for experience in a pedagogical atmosphere of support.

Child/Nature Affinity

This list was compiled as a result of the provisional analysis of the Weimar children's propositions for their chosen place. Various conditions of the relationship of the child to naturally occurring elements in the physical environment were derived from the children's representations. The decision to create a scale of this relationship facilitates a measure of the child's connection to these elements of nature.

The variables proposed below indicate a strong awareness of the forces at work in the natural environment. The question we may pose before analysis is; 'is this awareness based on a separation or an integration of self with these elements of nature?' The second question we need to pose here is, 'does this matter?' and, 'can we do anything to influence this?'

MAN/NATURE SEPARATION

MAN AS ORDERING ELEMENT IN THE ENVIRONMENT

MAN AS PROTECTIVE POWER:

MAN-MAINTAINED NATURE AND WILD NATURE IN TENSION

NATURAL/HUMAN CO-EXISTENCE

'SUPERIOR'BENEVOLENT NATURE

NATURE OVERPOWERING

SHAMEFUL MAN IN NATURE

MAN/NATURE SEPARATION

Man and Nature are perceived as two distinct unities. The children place the human-built structures on their drawings on a separate layer from the representation of the natural elements. This manifests often in the form of 'islands' of human activity, operating in opposition to the elemental forces of nature. There is no obvious relation of cause and effect between the two types, each existing for themselves in their own sphere of influence. This projection of the forces of nature as beyond our control (and therefore, beyond our consideration – what we can't control is not worth contemplation....) reveals itself as a worrying preoccupation of the sub-conscious. Dividing our pre-conception of the world into two wholes, the natural and the man-made, we render ourselves powerless. Imprinted within the child's mind is the notion that we cannot belong to this other 'whole' of the natural environment, because our place is in the man-made world. This attitude sets limits to the possible sphere of influence of the child, the dualistic tendencies of such a split automatically pit the one side *against* the other...

MAN AS PROTECTIVE POWER

Man is perceived in the role of protecting his constructed environment against the raw forces of nature. This distinction is evident where the child has drawn organic structures as two differing types of representation. The first resembles that of the category above, the second, presents 'nature' as a threat to the harmony and order of the human existence. The element of control is strongly evident. The child is aware of two things

here: man's capacity for creating structured environments and, the equal (if not stronger) capacity of the forces of nature to create (or destroy) and therefore shape and influence the form of our environment. This indicates a highly sophisticated reading of man's position in the larger system of the world. The fact that the child sees the necessity to 'protect' himself from these forces shows the distance of the relation between themselves and the forces. An Australian Aborigine boy would never portray such a relationship. His culture declares man to be a part of the wider system of the universe, as such, there is no need to question empathic bonds between him and these forces of nature. The one cannot operate without the other, and each gains from whatever exchange is encountered. This 'structural coupling' is never judged, or rarely given the label of, 'bad', which we, in our dualistic society have come to assign without question to any encounter.[18]

MAN AS ORDERING ELEMENT IN THE ENVIRONMENT

Man is perceived as the ordering force in the environment. Here, the elements of nature operate according to the control exerted over it by man. Anthropomorphic influence is visible in the form taken by the trees, in the shape of the pond. Wherever an organic structure is evident, the largest force for influence is portrayed by the child to be the hands of man. This is a cosy conception of the world, where man is seen to be able to control all aspects of his environment. Genetic engineering, modern medicine, huge urban planning schemes and the seemingly invincible ability of man to defy time and speed in communication conspire to compound this message. The invincibility comes under scrutiny when the news blasts photographs of the latest nuclear reactor catastrophe or the protests to gen-tech food become noisy enough to make worthy news. This sows seeds of doubt in the mind, but without any suitable alternative to follow, this news breeds apathy generated

[18] For more detailed descriptions of the Australian Aborigine way of life, read, Mutant Message Down Under. Marlo Morgan. Harper Collins Publishers. 1994

from frustration. The child is simply representing that value system which it has come to inherit.

MAN-MAINTAINED NATURE AND WILD NATURE IN TENSION

Man and nature are perceived to have similarly dominant roles in forming the environment, however there is a perceived discomfort at the interface of the naturally formed world and the man-formed world.

This is a description of the interaction between those elements occurring in the environment which do not depend on man and those which exits as a result of man's action in the environment. The, *tree with bird- an obviously pollarded tree subject to strong maintenance measures, but still able to support natural life*[19] depicted in one of the Weimar children's drawings, illustrates their preoccupation with this tension. Such tension is evident also in the picture of the tiny single flower, dwarfed by equipment.[20]The flower appears to be from the wind and blowing over the sky. The child has an innate grasp of the difference between the robust trees surrounding the playground and the fragility of this introduced specimen. The omission of the trees from the drawing suggests the manner in which the child takes their stable presence for granted. The flower, on the other hand, brightly coloured and exotic, is treated much as the rose in Antoine de Saint-Exupery's, The Little Prince – perceived as a delicate specimen of man's cultivation.

This juxtaposition of man and 'wild' nature can be seen in Group D of the Walter Rathenau School. They drew the tame world of domesticated rabbit in a hut on one side of a large tree, the other side was filled with the unchecked growth of a bush, wild flowers in a meadow grass and a free-roaming squirrel. This does not necessarily indicate antipathy between the child and the wilder side of nature. It does reveal the child's awareness of a difference: one caused by man's direct influence on the natural elements occurring in the

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[19] See Chapter 5.
[20] Group C of the Walter Rathenau School

external environment, and the other, shaped directly by nature. An addition to this understanding could be found in the expression of the wider influence of man on the natural environment, such as weather patterns, global warming, soil or water quality, air pollution, changes to microclimate etc.

NATURAL/HUMAN CO-EXISTENCE

This is a perceived sharing of the task of forming the environment; man and nature in equal partnership. The children have shown a most beautiful philosophy of their relation to nature: man and nature stand in partnership, each valid in function, decoration, and symbol. A most graphic example of this is in group B, Walter Rathenau School: *Tree integrated into the play structure: tree-trunk supports the tree house, archway over tree, contains it within the structure, tower higher than tree, tree-trunk and tower in the water etc.*. Together, the tree and the man-made structures form a continuous whole. This structure would improve with time, the years would increase the integration – the archway over the tree could be interpreted symbolically. The arch of the rainbow has long established tradition, indicating reconciliation between man and the wilder side of nature. This type of integration could be termed ecological consciousness. There is no separation, but relation, the different elements form a whole.

SUPERIOR BENEVOLENT NATURE

This is the perception of nature as a benevolent force more powerful than man. The Walter Rathenau children illustrate this graphically in the use of rainbows. These are set as huge bows of colour in the sky, dominating the scene and imparting it with a vibrancy of colour. The suggestions for change to the playground are given their place beneath this piece of natural generosity, framed. In the same way, some of the children covered the page with enormous trees. (Group D) The tree organises the entire page and additional elements are grouped about and beneath its protective cover. The use of huge suns project a similar

message; the sun is the giver of all light and energy, ever present above us... The scale of the suns is far larger than reality, thus emphasising its importance.

The sunshine, rainbows, and huge trees are symbolic images to which the children have turned to convey a deeply held idea (construct) about their world. The child has no access to physical experience of such huge suns, rainbows etc.; their depiction is a means to express their subjective 'feelings' about the environment around them. In their *ideal playground*, nature would be *this* powerful, we would be aware of the presence of nature. This suggests a nostalgic attachment to some form of ancestral picture of wild nature.[21]

NATURE OVERPOWERING

This is the perception of nature as the all-powerful, overwhelming force in the environment, dwarfing man's activities into inconsequence. This continues the imagery of the previous variable, but places man in a disadvantaged role. Huge weather patterns, (rain, storm, wind) are portrayed as threatening, chastening elements. This indicates a sense of judgement within the children- the elements are more powerful than man, and chastise us accordingly for our impertinence in daring to defy them. This almost has an 'Old Testament' flavour to it; the vengeful God, out to wreck havoc on disobedient man. The origin of such beliefs is not hard to find. Plenty of media stories concern themselves with man's assault on the natural environment, duly chastised by some *natural* catastrophe. No solution is presented and little attempt is made to form the systemic connections of cause and effect. The children soak up such mythological stories of phenomena as are presented to them.

SHAMEFUL MAN IN NATURE

This is the perception of nature as the 'good' force, and man as the shameful, 'bad' force at work in forming the environment. The children appear to have felt positively ashamed

for the actions of man within the environment. The signposts, (evident in many of the Walter Rathenau School children's drawings) prohibiting litter are drawn next to piles of broken bottles and abandoned tin cans. The children were invited to portray that which should be changed, in addition to their new proposals. Often, these ill-wanted features were hidden as far as possible by the commanding presence of a rainbow. The children seemed more comfortable identifying themselves with the positive power of the rainbow, than the waste of thoughtless people. This could be indicative of a tendency of the children to disengage themselves from the irresponsible actions of the adults (and teenagers) who formed their environment. This reads as a subconscious plea, to, 'do it differently'. W.M. Adams[22] discussed this sense of outrage, which he himself developed as a child on witnessing adult inappropriate behaviour in his environment. *To me this was a symbol, a worked example of humanity at its most outrageous; greedy, selfish, thoughtless and uncaring.* He claimed that this type of conscious realisation was often the crystallising moment when a child, *began to understand the effects of industrialised society on wildlife and the countryside.* The question is; if they see no examples of this 'rightness' within their own environment, how are they going to be able to create it for themselves?.....

Detailed Variable Analysis of Representative Examples from the Weimar School Children

The diagrams below illustrate the effect of these variables acting upon the child, according to the Perception-Assimilation-Motivation Model of Non-Directive Experiential Learning. The images assist in understanding the learning processes engaged in by the Weimar children in the following analysis.

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[21] See Jung, or Durkheim for their theses on collective consciousness and the shared myth prototypes.
[22] Adams, W.M. FUTURE NATURE Earthscan 1996 ISBN 1-85383-3045 Chapter: Culture and the Countryside Page 78 - 79

This analysis was conducted on a selection of the drawings produced in *Week 2 The Neighbourhood, Week Three*, *Choosing Favourite Places,* and *Week Six Drawing on Improvements.* The tables are structured as follows:

A	B	C
Week 2 The Neighbour-hood	Week 3 Choosing Places	Week 6 Drawing improvements
One of the following sixteen variables		

The analysis of the child/nature relationship is to be interpreted in the form of a scale, based on Johnson's Grey-Green Scale of Sustainability referred to at the end of Chapter 2[23]. The left-hand side of the following diagram boxes represents a natural world antipathetic to the child; the right hand side represents a natural world, of which the child is in awe. The central positions represent those attitudes of integration between the child and his natural physical environment *Nature* is used here to symbolise the elements of the living environment, as opposed to the constructed environment. Using a scale enables the portrayal of subjective phenomena with a clear legibility. The scale was applied to the

[23] Dr. Ian Cooper used Johnson's Scale of Sustainability (which was developed as part of the Green Dictionary – Key Words, Ideas and Relationships for the Future. Macdonald, Optima, 1991) for his research work leading to; 'Teaching Sustainability in UK Schools of Architecture.' The Challenge of Sustainability Conference. Cambridge 1993

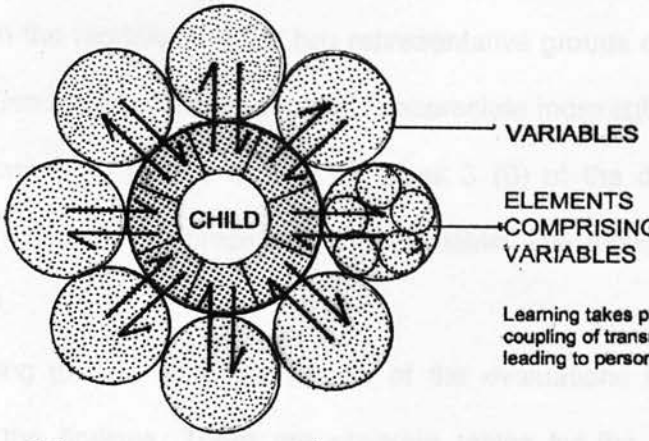


Diagram illustrating the ideal relationship between variables contained in the environment and the learning child

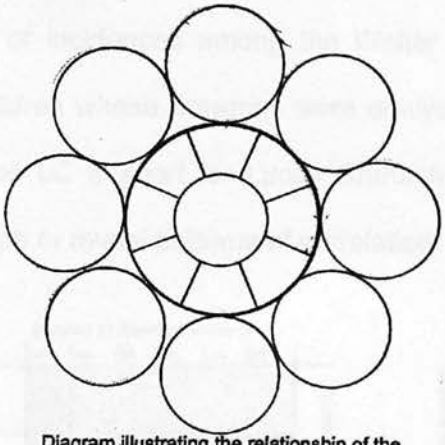
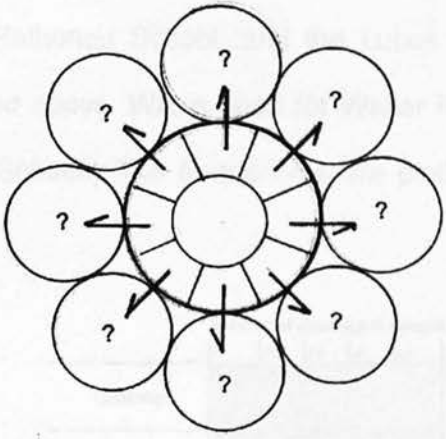


Diagram illustrating the relationship of the learning child to the hostile environment where no variables are adequately expressed



Perceptors are left unfulfilled and learning is absent

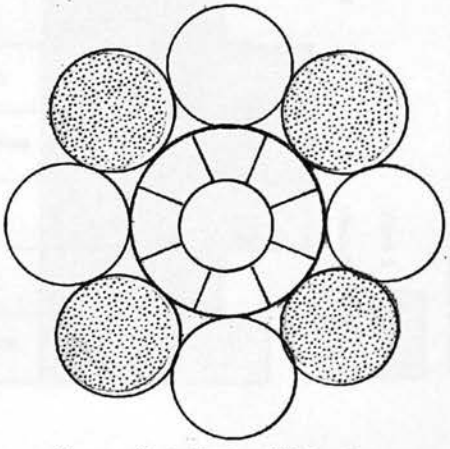
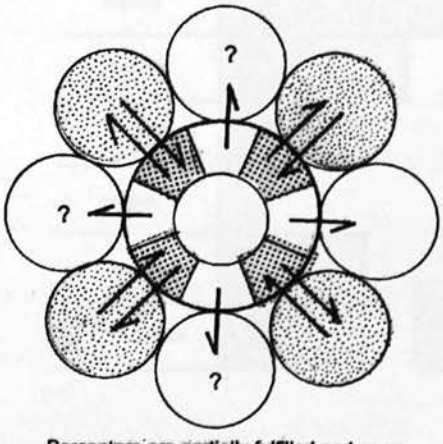


Diagram illustrating the child / environment relationship where variables are partially expressed



Perceptors are partially fulfilled and some learning experiences occur.

FIGURE 126 DIAGRAMS ILLUSRATING THE CHILD/NATURE AFFINITY OF HOSTILE AND PREPARED ENVIRONMENTS

analysis of the children's drawings in order to reveal variations and coherent patterns occurring in the renditions of the two representative groups of school children. The scale specificity used eight variables in order to appreciate more subtle differences in evaluation. In many cases, no picture existed for week 3 (B) of the data collection process. The crosses (X) indicate the presence of the variable. The evaluation tables are included in Appendix 3.

The following graphs bring the results of the evaluations together for the purpose of explaining the findings. There are separate tables for the child's relationship towards nature, and for the eight variables of place. The first two lines in the tables indicate the frequency of incidences among the Walter Rathenau School, and the Lucas Cranach School children whose drawings were analysed above. WR is short for Walter Rathenau School, and LC is short for Lucas Cranach School.) The frequencies are plotted on a simple graph to reveal patterns of correlation:

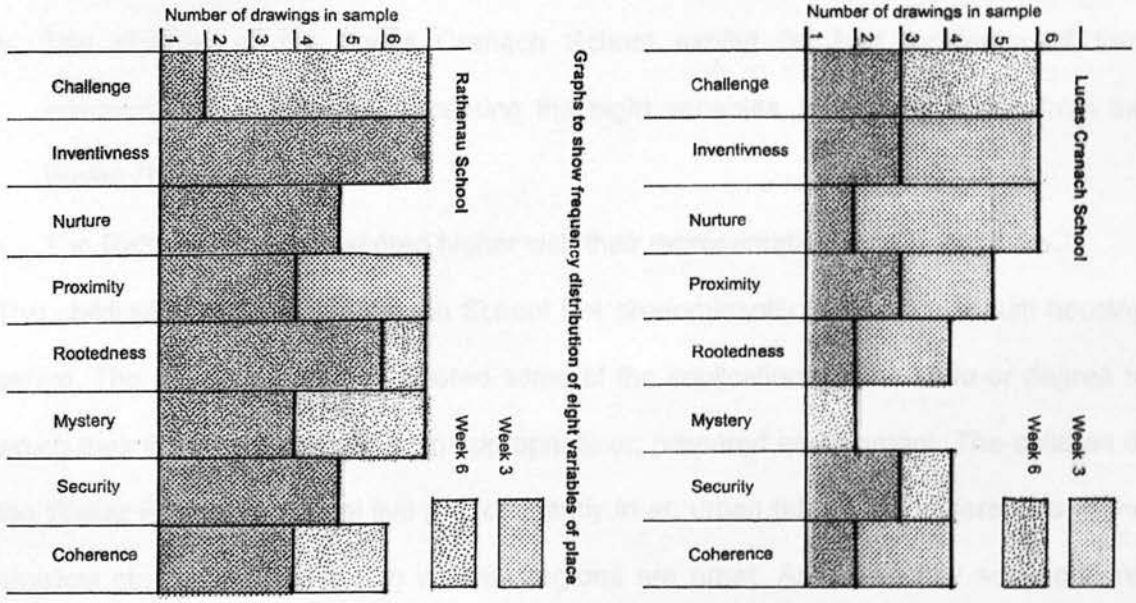


FIGURE 127 GRAPHS TO SHOW FREQUENCY DISTRIBUTION OF THE EIGHT VARIABLES OF PLACE

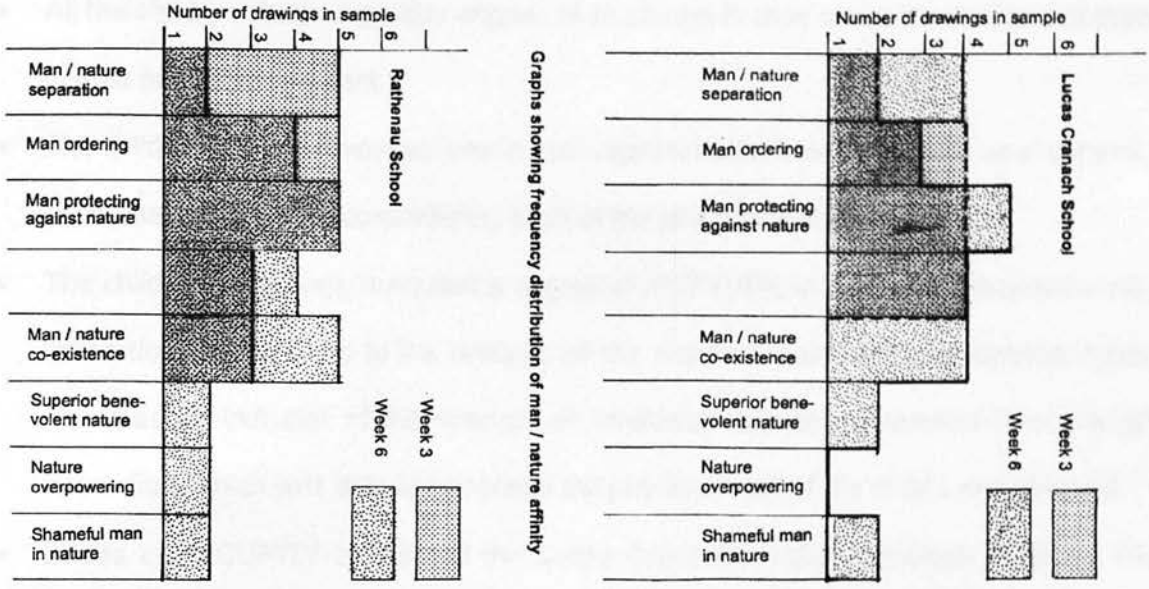


FIGURE 128 GRAPHS TO SHOW FREQUENCY DISTRIBUTION OF THE CHILD/NATURE AFFINITY VARIABLES

Findings: What is to be learned from the tables?

- The children of the Lucas Cranach School exhibit far less incidence of their environments adequately expressing the eight variables, than the children from the Walter Rathenau School.
- The Rathenau children scored higher with their representations of the variables.

The children of the Lucas Cranach School live predominantly in the Soviet-built housing estate. The author has partly explored some of the implications of the state or degree to which their living environment is an appropriate or, prepared environment. The children of the Walter Rathenau School live predominantly in an urban fabric. The differences in the physical structure of these two Weimar regions are great. Are there any socio-cultural factors responsible for influencing the internal cognitive and emotional structures of these children, which would suggest differences in the experience to which they choose to expose themselves?

Lucas Cranach School: Weimar Nord

- All the children chose a greater degree of challenge in their created environment than in their home environment.
- The children showed inventiveness in their *representations* of their home environment, to counteract the often-contradictory truth of the physical evidence.
- The children's drawings illustrated a degree of NURTURE in their home environments, which does not bear up to the analysis of the physical reality of these environments. This was an indicator of the strength of emotional affinities generated from human interaction, which was able to transcend the physical facts of the child's environment.
- Issues of SECURITY concerned the Lucas Cranach children precisely because the physical environment offers so little.
- The Cranach children steered away from attributes of MYSTERY in their proposals. This quality was rarely evident in the physical environment of Weimar Nord.
- It appears that a sense of COHERENCE of a place is difficult for the children to reproduce. This re-occurring gulf in the results, between the environment experienced by the child (her home), and the projected environment of her imagination, (her adapted chosen place) can be explained as follows:

The children were aware of missing experiences which they required but had inadequate facilities to express this into a language of physical form. The fact that the children unfailingly portrayed elements of senso-motoric stimuli in their proposed environments points to the satisfaction, which these children have obtained from engaging in such stimuli-oriented environments. The type of stimuli which the children chose were short term, high energy, visually engaging, static pieces of equipment which pre-determined the type of experience to be gained. These *coded* texts tell the message: *you will use up your energy when you slide/climb/swing etc. on me, and come home quiet and tired afterwards.* This satisfaction is important, but, does not include other aspects of the human need structure which must be satisfied for homeostatic growth.

At some point in time, the child will have fulfilled his capacity for experiential learning with these environmental triggers, (just as the child who runs sand through his fingers three hundred times eventually learns to understand its properties.) When there ceases to be any interaction between the environment and the individual, we can class this environment as the second type of hostile environment; it has exhausted its potential to trigger reaction, the children resort to climbing the fence and ripping it. How does this occur? There is no in-built capacity for change – other than through its destruction...

Static environments, where little play is allowed for creative interaction and modification are bound for destruction or abuse.[24]

Statically designed environments can be compared to amphetamines: they generate short-term satisfaction. Their effect is non-sustainable because sooner or later the drug ceases to induce the original stimulus. Two choices are left to the user: he can increase his dosage, with the possibility that his health (development) will suffer (non-homeostasis), or he can abandon the drug, and seek something which will bring him long term satisfaction. Unwittingly, the Cranach children are paving the way for further environmental destruction with their propositions. What is the reason for this short-sightedness?

In almost every case, the Cranach children have taken elements from their known environment and recombined or adjusted them to fit in with their own picture of perfection. These are described above. The reason that the children cannot generate other forms of experience is because these other forms are unknown to them, or taken for granted by the prevailing social culture.

The social structure is so organised in Weimar Nord that children spend the afternoons in activity centres, at home alone with the computer or television, or with elderly relatives – at the playground. The inadequately designed playgrounds become the meeting places for children and adults. Equipment sporting safety standards satisfies caretakers that the

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[24] Since the author's presentation to the Weimar planning authority, several changes have been made to Weimar Nord and the Weimarhallenpark, many of which support the work carried out by the children.

necessary thought has been invested into the play equipment. Any additional experience must be sought out by the children themselves – the result being that, choices such as the *Green house* which have elements of real danger for children, are preferred to the established playgrounds. The children seek their adventures within the bounds of their personal social and physical restrictions.

Walter Rathenau School: Bahnhof Quarter

The six Rathenau children exhibited a level of competence in the design choices for their playground. All of the variables, except for proximity are equally present, if not exceeded in the environments, which the children designed, compared to their own homes. These children have a clear aim of what they want to see in their world, and have the necessary confidence to produce it as an image. The following is a compilation of the important points:

- The children mostly viewed their home environment as without CHALLENGE. The drawings for the Weimarhallen Park Playground presented numerous elements (particularly those reading as *un-coded* messages, such as plants and wildlife) which satisfied the children's need for challenge. It appears that the children perceived their homes to have the function of safe, 'havens' to which they could return after their adventures.
- The variable for MYSTERY was highly represented in the children's proposals. The need to hide, to play independently, but still to command views of the surrounding area was clearly shown in all of the week six drawings.

Comparisons between the two schools

There are several gaps between the two schools, which demand attention. The most prominent of these are the different degrees of, ROOTEDNESS, MYSTERY, INVENTIVENESS and COHERENCE shown in the drawing proposals for the two chosen

playgrounds. How can we account for this, and what consequence does this have for the manner in which we create children's environments?

The Rathenau children showed a strong attachment to the place they were designing for. They drew themselves in the pictures, and implied often an ongoing program of maintenance. This may be attributed to several issues: many of the Rathenau children have regular access to an allotment – belonging to their parents or their grandparents. The children have had experience of working in the school garden, tending plants and aiding in the creation of a willow house. The same children took pains to point out child-built structures along our 'walkaround', and they had a developed sense of pride in their own creation. These children are encouraged to draw whatever ideas they have in a free and expressive way – the only limit imposed on by the teacher is time. The children are used to join together with a parallel class to participate in termly project weeks, where independent work is encouraged. We could argue that the children of the Rathenau school are more, *empowered* than their neighbours at the Cranach School.

The failing sense of MYSTERY in the Cranach children's playground proposals of Week 6 has been attributed to their physical environment, so too, COHERENCE. We encounter problems once more when we try to explain the deficit in INVENTIVENESS:

- One curious phenomenon about the Lucas Cranach School drawings was their list-like format. It appeared that these children had been encouraged to think in rational form, compiling lists of elements, which, on combination, comprise the world. The Rathenau children took a different approach by creating drawings of fully finished *places*, where the sum of the parts made more than the whole... Their drawings were far more holistic in nature. From analysis of artwork publicly displayed at the Lucas Cranach School, it appeared that 'art' for these children consisted of being able to copy the teacher's prototype, self-expression was limited.

This social conditioning was repeated in the larger physical environment; one standard architectural form suffices for hundreds (tens of thousands if we start looking at the entire

former soviet block.) of (different) people. The *plattenbau* structures and the spaces created in between were carefully intended as a form of subversive social conditioning system. The children of the Cranach school, although born at the end of the Soviet reign, were still encountering the effects of an enormous propaganda machine.

Examining the Children's Relationship with Nature

The fourth, fifth and sixth factors represent ecological consciousness within the table. Those to the left of these represent man as a separate entity from the natural environment, which surrounds him. Those to the right offer the other extreme, where the natural environment is somehow threatening to man's very existence by dint of her extreme power. Ecological consciousness pleads for the middle way, where man is an integral part of the whole in which he exists. By measuring the degree to which the Weimar school children adhere to this measure of ecological consciousness, the author begins to define their relationship to the physical environment in which they live.

The findings from the left-hand side of the graph begin the discussion:

The Lucas Cranach children's drawings of home, and the playground proposals produced similar results. Their ideas changed little when given the freedom to create something new. This indicates a structure of perception about their place in the environment, which is established. The Cranach children had almost more than twice the number of entries in the first three positions on the table compared to the middle three positions signify a relationship of sustainability between man and the physical environment. The last three variables, where nature triumphs, were largely absent.

The most dramatic difference between the home and the playground drawings was in the variable: Natural/Human Co-existence. This jumped from 0 to 3. Here, the children indicated an increase in awareness over time (the duration of the research project) of the importance of this attitude.

The Walter Rathenau School showed more encouraging results in terms of a sustainable relation between man and nature: A marked decrease in the separation of man from his natural physical environment was evident in the playground proposal drawings compared to the readings from their home environments. The increase measured in the Natural/Human Co-existence variable confirmed this trend of the children wishing for a more intense engagement. Additionally, the Rathenau children appeared to need less 'protection' from the natural elements than their home-making parents might think... Both schools showed a slight decrease over the course of the project, in the need to protect themselves against, 'disturbing' elements of the natural environment.

The last three variables provided a glimpse into the influence of the historical cultural perspective of the relationship of the child to her natural environment. These feature strongly in myth, and, in particularly in the German fairytale tradition.[25] The symbol of the rainbow, the huge rendition of the elements of weather, both indicate that nature is a power of its own, best treated with fear and respect, lest she suddenly seek revenge for unwelcome actions by man. The simple rules of cause and effect have no place here; nature is assigned the role of the unpredictable master.

The Walter Rathenau Children fared better than the Lucas Cranach children in their development of increased awareness of their natural environment did; negative trends decreased, positive trends increased. The Cranach children were more conservative, changing their views little. Their lack of experience with exercising their own creativity, and the clear existence of a dominating socio-cultural paradigm confirmed to them daily through interaction with their soviet-planned physical environment, help to explain this reluctance. However, overall, the two schools differed little in this closer analysis of the sample of twelve children.

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[25] The brothers Grimm documented most of the traditional mythical stories, which had been kept alive in the German culture through story telling. Cammille Estes Pinke has analysed several of these tales in her book, Die Wolfs Frau. 1997

Conclusion 1.

The variables depict the needs of children in the environment. If these needs are provided for through planning, their needs will be fulfilled and this will become embedded into the consciousness as a construct. A base for value formation is created through the experience.

Applying the Variables to the Hütschenhausen Kindergarten:

The variable analysis was applied to the Hütschenhausen Kindergarten as an assessment with which to measure its quality as a model external environment.

Based on the analysis of the Hütschenhausen kindergarten in Chapter Five, the following assessments were made:

TABLE O VARIABLE ANALYSIS OF HÜTSCHENHAUSEN KINDERGARTEN

X	X	X	X	X	X	X	X
CHALLENGE Triggers for experience	INVENTIVENESS : Creative activity, problem	NURTURE and the maintained environment	PROXIMITY	ROOTEDNESS	MYSTERY	SECURITY (LEGIBILITY)	COHERENCE
Structured+unstructured material. Spatial structure supporting diversity	Children's re-appropriation. Flexibility. Lateral thinking(pipe, willow)	Self-directed participative responsibility (socially encouraged)	Spatial structuring, free access for all children,(doors)	Participation breeds ownership. Emotional affinity through action	Spatial structure,unexpected texture, uncoded messages	Contained prepared environment:freedom within defined phys/social limits	Hierarchyofspace,connecting elements .Experience of natural processes

All eight variables were found to be present. Below is the expanded qualification for the presence of each variable.

CHALLENGE

The predominating organic material has great innate flexibility, which allows for a wide range of interpretation and use. The quality of challenge is further increased by seasonal

change; Frost, fallen leaves, slippery mud, sprouting shoots, powder sand, challenge the children to new activity.

The structures are planned so that each child satisfies her own needs and abilities. The slide, tyre slope and Hercules ramp can for example, be climbed at varying levels of difficulty.

INVENTIVENESS

The wealth of material and the many niches for activity provide scope for reappropriation of function and recombination of the existing elements to bring forth new creative play possibilities. The planners showed lateral thinking in their designing work by the choice and application of material.

NURTURE

The children take on the quantity of responsibility, which they can handle. The kindergarten provides the children with the possibility to engage in maintenance and in designing creative additions to the plant scheme. The children experience the engagement of the adults through these participative planting schemes, fire festivals and general maintenance of the grounds.

PROXIMITY

The play environment is always within safe distance and access of an adult due to new doorways built into each classroom. The adults stick close to the building – so that the child can always see them, and the adult can survey the children's activities.

ROOTEDNESS

Participation in the building process breeds affinity for the place. Due to constant changing and shaping of the environment by the children, they develop strong emotional affinity for the grounds.

MYSTERY

The spatial structure is so conceived that the central space about the building is open to clear sight lines. The building is the main orientation feature. Beyond this open space is a

second layer of niche environments where only controlled views are possible. This second layer is hidden from view, and yet easily perceived. The children can hide and pursue their own activities of discovery without fear of getting lost. The material used for the experiential path is another example of mystery.

SECURITY/LEGIBILITY

The borders to the kindergarten are clearly detected in the surrounding hedge. The children are aware of the barriers to movement, they can detect the main spaces and orientate their activity, feeling secure. The environment has not been built in a chance, or haphazard manner, but as a prepared environment, specifically tailored to the needs of children. The limits to safe action have either been built into the structures, or specifically defined by the staff. The pedagogical tenet that the child can assess her own degree of readiness for the activity she chooses has found success in safety records- the children fall far less than they used to, and have far more freedom to practice climbing and balancing.

COHERENCE

The spatial hierarchy already mentioned provides a clear structure of orientation for the child's understanding of the place. The two principle hierarchies of space, (niche and free-space) allow for clarity.

Coherence is also visible in the manner in which the environment was formed. The children witness how a tree is planted, how a willow tunnel is built, and what is it, which occurs to a seed when planted in the earth in springtime. The natural diversity affords a coherence of the processes occurring in the environment, just as the water pump affords an understanding of the scarcity and value of water.

The table below reveals the main findings of the Child/Nature affinity analysis.

Child/Nature Affinity

TABLE P VARIABLE ANALYSIS OF HÜTSCHENHAUSEN KINDERGARTEN MAN/NATURE

	X			X	X		
Man/Nature separation	Man ordering	Man protecting against	Man and wild nature in tension	Nature/ Human co-existence	Superior benevolent nature	Nature overpowering	Shameful man in nature
Child empowered part of nature. Prepared environment	Structure environment built by participation (coded messages)	Prepared environment	Child empowered part of nature. Prepared environment	Mutual interactive development: nature and man,	Ecology: natural homeostasis. Child as part of ecology.	Child empowered part of nature. Prepared environment	Child empowered part of nature. Prepared environment

Man/Nature Separation

There is no separation as the child operates in and with elements of the natural environment and is affected by them.

Man Ordering

The planners have created an environment populated by nature but structured for the fuller use of the children. The elements of nature are free to develop in synergy with the children, to their climax state.

Man Protecting Against Nature

Nettles, thorns, sharp stones and slippery surfaces are a part of the prepared environment. These elements of danger are contained within the wider diversity of the environment. The children are free to experience these elements as part of their learning process. Poisonous seeds and berries are however not used; allowing experience of this would be negating responsibility to the child.

Man and Wild Nature in Tension

There is a flow of cause and effect in the Hütschenhausen grounds such as in the water system. The number of children attending the kindergarten is related to the carrying capacity, (the ability for the environment to naturally rejuvenate) of the natural

environment. The children act on their environment, using branches, leaves, flowers and seeds for their play, and the vegetation, water table and soil react.

Nature/Human Co-existence

The interdependence described above, is the synergy which maintains the homeostatic balance of the environment. The children helped to create their environment and built up an affinity with it. They then act on it and see the effect of their actions. Because of their affinity they check and adapt their actions so that the source of their activity – the environment- is not damaged, but maintained. This example can be seen in the vivid example of the water pump, which lends itself to easy explanation of processes of cause, effect and interaction.

Superior Benevolent Nature

The children develop an innate respect for the processes and elements of the natural environment by acting autonomously within it. They appreciate the value of an element when it becomes scarce. The task of the adults is to intervene if the resource becomes too scarce to regenerate (such as pulling off too many seed heads, leaving none for the next season). Staff can take one of two actions: to increase the quantity of the resource, or, through example of activity allow the children to come to an understanding of the unique nature of the resource, which they are depleting. In such a diverse environment this occurs rarely. Shortage is an indication of the necessary to adapt the environment to the needs of the children, (in this example, by planting more flowers, which develop good seed heads).

Nature Overpowering

The prepared environment is so structured that the child never feels overpowered by his environment. Staying inside, wearing protective raingear, or taking shelter in one of the secure niches can cater for extremes of weather.

Shameful Man in Nature

Through the participative building process, the children have transformed any lingering feelings of shame and waste associated with the environment. The grounds were enriched

by planting, creating subsequent homes for wildlife and other synergetic effects. Old, waste material was transformed into a positive resource (such as abandoned rubber tyres), decayed elements, (such as the staircase balustrade) were renovated and improved.

The Hütschenhausen Kindergarten satisfies all of the eight variables for place and the relationship to the natural environment is recorded in the most 'sustainable' region of the scale. The Hütschenhausen Kindergarten can be confirmed as a model of sustainable planning and pedagogical practice, leading to the development of an ecological consciousness in the children attending.

Chapter 9

Conclusion

Introduction

The conclusion furnishes us with the opportunity of pulling back from the practical details of the research, to observe the larger framework to which it has contributed. Three major areas of theory 'glow' in the research: Learning, Ecology and Evolution. Learning and Ecology have manifested themselves within the framework of individual systems which, together with evolution, combine to form the structuralist theoretical framework of the research; a three-dimensional integration of distinct and yet interacting systems. Evolution *operates far from equilibrium and unfolds through an interplay of adaptation and creation.* [1] These can be labeled ecology and learning. Ecology can be explained as; *self-maintenance*, which includes adaptation and homeostasis, a principle, explored in our Perception/Assimilation/Motivation Model in terms of motivation for experience. Ecology is based on the nature of the relationship between the individual and the environment, social or physical. Learning, Capra labeled as, *self-transformation*, which includes development.

In a similar manner, the concept of sustainable development can be returned to. The systems theory of evolution is comprised of two *complementary dynamic phenomena*[2], and so is the ethic of sustainable development. The term is a functioning oxymoron.

The research has developed from the traditional concept of evolution: *moving towards a steady state,* and reaches towards the practical forms of a new paradigm rooted in systems theory:

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[1] Capra, Fritjof. The Turning Point. 1983 Flamingo. Page 311
[2] Capra. 1983 Page 309

Learning

Learning is here associated with the development of values formed through experiential interaction between the individual, her physical, and her social environment. The field of experiential learning has been discussed theoretically (in Chapter 3), and tested empirically with the children of the two Weimar schools. The research was so constructed as to facilitate a wide range of structural coupling processes. This was necessary to investigate the effect upon the children of their exposure to differing environmental conditions. Participation was chosen as the vehicle for this methodology, based upon Harts' definition of a non-directive relationship between child and adult.[3]

Ecology

Ecology has been addressed in the investigations of the nature of the child's relationship to his physical environment. The author sought to address how this relationship is governed by the predominant cultural paradigm. In the Perception/Assimilation/Motivation model, this relationship was defined as the homeostatic balance sought between the needs of the individual and the processes of the external environment. The author has termed sustainable development as the equivalent to a measure of a homeostatic balance between man and nature, and how an ecological consciousness can govern this balance in an interactive process with the environment, approximate to the cybernetic model of feedback systems.

Evolution

The discussion on evolution has been a silent accomplice of this research. In defining evolution as the learning development occurring within the relationship of man to the

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[3] Piaget outlines the dangers clearly of maintaining a distance between child and adult in order not to influence the outcome of the research. This is discussed thoroughly in his book, The Child's Conception of the World. Jean Piaget. Littlefield Adams Quality Paperbacks Reprint 1951 ISBN 0 8226 0213 X

environment, we must assume that man is constantly acting upon this environment. Evolution occurs as a result of the ecological relationship and the resultant cultural values formed through this interaction. Liedloff's *continuum concept* presumed that there is the possibility of maintaining stability within the immediate physical environment, whereby a consistent cultural paradigm could operate. This ensures an interaction of sustainability with the environment. The author proposed an alternative to the traditional figurative transfer of cultural value from generation to generation, through first-hand operative experience. The water example is an example of adaptation to evolving environmental conditions without forfeiting a value system. Man's activity in his environment has taken on such large proportions of influence that the only stability lies in flexibility of adaptation. This occurs through learning based on direct experience, which is then applied connotatively. [4]

Fulfilling the Hypothesis

The author's hypothesis was to identify a means to design environments, which were appropriate for children, so that they could form an ecological consciousness. It was suggested that a series of factors could be identified which create and maintain adequate environmental experience for children. These adequate environmental experiences required definition. In addition the intention was made to inquire into the manner in which these experiences could be facilitated in the physical and social environment.

The hypothesis stated the assumption that appropriate experience could empower children into actions of caring for themselves and the physical environment. This would occur in the form of value transfer between repeated experience and subsequently generated cognitive structures. The research was aimed at revealing what forms of

[4] For a description of this kind of flexibility, see Capra, Fritjof. The Turning Point 1982 Pages 294-296

experience would lead to the formation of values of caring for the environment, which could generate future sustainable development.

The author's intention to gather her research directly from children led to the construction of a methodology which looked at the environment from the child's perspective. This method was to serve as a vehicle of empowerment in environmental awareness and be tested as a tool to create an effective method of designing appropriate environments for children.

The method aimed to first recognize the experiences available to the children and from this, to work towards improving the quality of experience.

The third case study of the Hütschenhausen kindergarten delivered valuable insights into appropriate experience for the development of sustainable values. What surprised the author however, throughout the study, was the quality of the children to transform available experience into appropriate experience through their perception. An emergent theme in the thesis became this ability of the child to transcend limitation, and exhibit adaptation. Those experiences, which the children identified as adequate, were often far from the ideal established from the author's own identification of appropriate. It became more and more apparent that unless sustainable development is set as a prerequisite on all levels of the environment (cultural and physical), children would simply continue to adapt, rather than demand an ideal. The lingering question from these results was: is it necessary to actively agitate towards sustainable development, or does society allow the individuals within it to react to existing conditions by evolving the personal needs?

The Hütschenhausen kindergarten exhibited a middle way to this issue: this environment had been consciously formed as an expression of sustainable development which was primarily constructed according to the developmental needs of the child. The environment facilitated adaptation by the child but within a structure, which served to nurture the development of cognitive experience based on low impact technology. Often similar experiences were engaged in by both sets of children (Weimar and Hütschenhausen), but

the physical text of the latter was consciously facilitative of ecological processes. The Weimar children appeared to seek similar challenges to their Hütschenhausen colleagues, but instead of finding their empowerment in activities motivated and encouraged by the adult world, they had to resort to strategies which pitted them at odds with the governing behavioral expectations. Such observations lead the author to assume the need for reconsideration not just of planning vocabulary, but of the vocabulary of cultural expectation of children's behavior.

Major Findings: Case Studies 1+2 Weimar School Children

The main findings arising from the enquiry into the Weimar children's environmental preferences are presented below. The findings have implications for the planning and educational strategies engaged in by the town of Weimar:

- Children need environments, which empower them to act independently, but which afford them security. The social role of the adult is to prepare the environment so as to minimise danger, and to distance himself or herself to the position of facilitative observer. Thus are the children able to satisfy their needs for developing independence, self-confidence and other skills according to their internal structure.
- When given the choice, children choose creatively and intuitively those physical conditions, which satisfy their needs.
- Cognitive constructs are formed as a result of the interaction of the child in, her social milieu and the physical environmental conditions.
- Children possess the ability to respond to inadequate physical and social conditions with creative solutions. The children were defiantly inventive despite the lack of facilitative experience in their environment.
- Children require the widest range of choice of structured and unstructured material, which affords experience of cause and effect autonomously, if they are to achieve homeostatic balance within themselves.

- The Weimar children's' physical environments influenced their value structures; the Lucas Cranach children begged for amusement parks and the Walter Rathenau children yearned for experience of nature.
- Destruction of the environment by children or youths can be seen as the creative alteration of an environment to provide adequate triggers for experience where the environment is otherwise hostile to development[5].
- The children would increase the quality and quantity of their engagement with natural elements of the physical environment if they were given the opportunity.
- The children proposed more integration with the natural environment.
- On applying the structural coupling adaptive principle to the Weimar children, the author reached the conclusion that the children's actions and diversity of experience will affect their future action in relation to that environment.
- It was found that, environments, which are flexible and allow for modification in accord with changing, needs will be sustainable: that is, maintained in a state of homeostasis (as are the users who create the modifications.)
- The children look after those environments, which they are able to influence.
- The children possessed the ability to influence their perception of place with that which they wanted to see, as opposed to the physical reality before them. Emotional motivators had the ability to transcend physical reality.

Findings Originating from the Case Study 1: Walter Rathenau School

- The children chose to enrich their existing experiential field by making adjustments to their existing environment. Little need was shown for radical divergence.
- The homes of the children were regarded as safe havens, where challenge from the external environment was restricted.

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[5] See fence example, Lucas Cranach School Chapter 5.

- The children repeatedly articulated their need for autonomy through their design proposals.
- Designing their environment came easily to these children, whose social (educational) conditioning had emphasised learning experiences, which empowered the children.
- During the learning/data collection process with the children, the drawings produced evidence that the children had developed an increased awareness for their relationship to the natural environment. Comparisons of drawings from week two, with the final models indicate an increase in the children's general ecological consciousness through engaging in the program.

Findings Originating from the Case Study 2: Lucas Cranach School

- The children exhibited a general concern for issues of personal security.
- MYSTERY was treated with distrust; the children were unable to reproduce this variable in their planning.
- COHERENT environments were difficult for these children to reproduce.
- The children created for the most part, environments, which delivered short-term satisfaction, despite being aware of the negative consequences of this. The children did not possess the ability to create environments, which could deliver experiences leading to homeostatic learning, without some form of external assistance.
- Those structures, which could lead to sustainable interactive learning process within the environment, were produced at the end of the planning process. These children required more time to understand their needs.
- The children were not able to reproduce those types of experiences, which did not exist within their cognitive structures, without the collective experience of the applied method. This resulted in their inability to satisfactorily fulfil all of the variables in their design, even though they had identified the need for them through their absence.

Without stimulus **or more time**, they were unable to articulate these needs into physical form.

- The children referred to in this study held their own views of the structure of the world about them. Their drawings and comments indicate knowledge of their environment. The symbolic language drawn onto the paper represents the child's perception of her socio-cultural and physical world. The author began to *read* this evidence through careful analysis.
- These children had difficulties in conceiving of their environment as holistic. The social and physical environment appeared to exert a strong influence upon the children, which generated a more reductionist view of the environment than the Rathenau children.

It can be understood how it is possible for a child to form a value through the process of direct experience. This liberates the child to a status of independence from adult determinism: The child can form his own values through experience in an environment structured according to his needs, and those of the physical environment. It would be logical to assume that this predilection exists equally for other experiences. In other words, whether *appropriate* or not (tending towards the formation of values of ecological consciousness or sustainability), a child will use whatever experience she has to form values.

Answering the Objectives

In the introduction the author proposed that society is generally looking towards new values during a time of cultural re-orientation.

The second assumption held that there could be a way to identify such values, and restore a balance to the natural and cultural ecology.

The third assumption held that sustainable development could provide the rationale behind the restoration of this balance.

The fourth assumption insisted that children hold the potential for bringing about this change.

Through the research of the available literature documenting the learning process and cognitive structure formation, the author identified how the child learns through the process of structural coupling with her environment. This can be expressed simply as:

trigger: action/perception: cognition

It follows that; the availability of triggers in the environment will influence the development of the cognitive structures.

The conclusion arrived at was; three elements act together in this process of action/perception: the internal cogntion of the individual, her physical environment and her socio-cultural environment. These form the past, present and future experiences of the individual. It followed, that the choice made by an individual to prefer one set of environmental triggers above another, results from her past interactions.

In Chapter 4, eight questions were asked, the first being:

- What do *sustainable physical contexts* look like? An answer to this is given below:

The Weimar children's place preference arose from the need to restore their experiential balance. The children could achieve a level of homeostasis necessary for their personal development, through subsidising their daily experience of obligation with an experience based on choice.

Several of the Cranach School children chose potentially dangerous experiences to counteract the static environment of the playgrounds- their assigned environments. Where children were denied access to such areas (by parents), they sought other methods to enrich their experience. Laura and Lydia drew on their experience of adventure playgrounds to re-create the emotional triggers which they no longer gained from their

existing playgrounds which were predominantly static in nature. The experiences on offer were based on consumption which had a short-lived effect, rather than empowering actions which are the basis for sustainable development. Whatever coupling effect occurring was confined to changes in the physical body of the child.

The Weimarhallen Park playground, provided opportunity for the children to satisfy local bodily needs of physical experience, in addition to a wider range of creative experience offered in the flexible environment of the surrounding woodland area. It was concluded that creating an appropriate environment for children is not necessarily about addressing specifically pre-identified needs, but more about creating a sufficient diversity of triggers from which the children can choose according to their development.

The definition of a *sustainable physical context* is determined by what is agreed upon as a suitable outcome of development. A culture of sustainability, whose members share an ecological consciousness, will choose a specific set of triggers.

The Hütschenhausen Kindergarten was confirmed as a model sustainable environment: interaction within the environment gave rise to the formation of constructs appropriate to the development of sustainable values. This environment was furnished with a set of environmental triggers conducive to the formation of these values.

- How are these *contexts* to be constructed and managed?

The Weimar case studies proved the benefit of working with children over a period of time in order to gain access to their perceptions of the environment. Thirteen weeks' work had equipped the children with the confidence to take the design process into their hands. The process at least partially fulfilled its aim of offering children an instrument with which to voice their needs. The Hütschenhausen kindergarten was planned for the children, but built by them. The Weimar school children were older than the Hütschenhausen children and therefore able to express their needs in a manner, which the observing adults could interpret. Stadt+Natur built the Hütschenhausen kindergarten as a framework into which the children could express their needs without requiring the role of the adult interpreter.

The near-natural framework and diverse niches acted in a similar manner to the diversity of places chosen by the Weimar children. What the planner can bear in mind when planning for older children is to provide a diversity of environments, with scope for personal adaptation. If a playground were to be built the planners would do well to look at the present use of space by children and either improve these, or substitute them. The planners carry responsibility for the children using their environments. The use of participation can ensure that this responsibility for the child's welfare acts in synchronicity with the needs of the children.

- What kind of governance structures can be used for genuine democratic participation?

It was recognised that the longer the children were given to familiarise themselves with the issues of their external environment, the more motivated and creative they became in their suggestions for improvement. It was also recognised that, once having adjusted to being given choice and freedom to express personal ideas, the Weimar children began to pour out proposals. The author found it necessary to restrict this stage for the practical purposes of the study. Ideally however, the method could become an integral part of the teaching curriculum where a forum is created for the outpouring of such ideas. The author had based part of the method upon Hart and Sutton's schemes of participative democratic decision-making. The additional stage of critique engaged in during week seven afforded a focused base for decision-making, which was found to be effective in achieving results.

- Who is involved in this participation?
- What is the role of the child, and what, the role of the adult?

The controlling role of the planners is evident in the author's method and in that of Stadt+Natur. The author is left with the question however, of whether the more suitable method is simply to allocate pieces of land with varying physical qualities for the use of children, rather than focusing intently on a particular playground which is to fulfil all the needs, such as the Hütschenhausen kindergarten. The advantages of the kindergarten playground were that the process itself facilitated social bonding in addition to the building

of environmental affinity. Giving children pieces of land to develop themselves removes the adults from their position of importance, and therefore diminishes the potential for social interaction within the community.

A middle way is to give the child as much freedom as possible by developing methods to allow their wishes to be expressed. These wishes could then be built with maximum interaction between the children, planners, and the community in which the environment is to be improved.

- What do *empowering learning processes* look like in practice?
- How are children taught in this context?

Some of the Weimar school children were able to develop through the process of the thirteen weeks to a stage where they were willing to make independent decisions from their own directives. The method form had empowered them to overcome the teaching methods practised at the schools and to some extent their wishes to avoid co-operation. The author assumes that this was a result of the high degree of mutual respect engendered from operating at the higher end of Hart's ladder of participation. The Hütschenhausen kindergarten provided an example where this empowerment was realised in the built environment rather than in a planning process. The water example was a clear instance whereby children were given the freedom to make decisions based on their own experience. This was made possible due to the nature of the rapid cause and effect transfer in the action of water collection and usage. It follows that any other elements, which can successfully create this swift and understandable connection, will also empower children into independent decision-making.

- What are the measures for environmentally responsible behaviour?

The Lucas Cranach drawings of play equipment in week six revealed a collection of environments to be consumed, and not associated with a relationship of responsibility or caring. The children were preoccupied with fulfilling their own experiential deficits before they could develop a relationship of caring to the environment. The Hütschenhausen

children were accustomed to playing in an environment of diversity and flexibility, which offered a range of choice within a protected structure. These children had integrated environmental responsibility into their daily play. The author concludes that basic needs can only be accommodated in an environment, which is built upon principles of diversity and flexibility. If in addition the opportunity is provided for children to experience the result of their actions, this structural coupling supplies the nourishment for building responsibility. What is vital however, is that the adults co-operate. Either through spoken word, or more effectively, through the establishment of clear *texts* in the environment.

Based on the evidence of the Hütschenhausen example and other environments created with the same intention[6] the author advocates the following:

Interpreting the Semiotic Evidence:

Transference of Symbolism in Architecture (Planning)

The case study analysis was conducted using a semiotic approach. The drawn environments of the Weimar children, were read as text, individual elements were interpreted symbolically and factually. Children were found to rely heavily on the use of symbol to express their relationship to place. **The recumbent tree** of the Hütschenhausen Kindergarten alerted us to this fact. The *coded messages* mediated through this tree, *you may climb this irregular surface, the tree is valuable without modification, we furnish you with objects of flexible interpretive qualities*, and the *uncoded messages* such as texture, size, colour, changes in temperature and decomposing material, provide the raw material of the child's symbolic interpretation. The tree came to be used as a rocket, ship, and aeroplane, all large objects. The children used the roots to leave small offerings to fairies. The children recognised this large object as belonging to the category of elements not constructed by man, in other words, by some *other* force. Leaving offerings for fairies

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[6] See Gründler, Elisabeth C. and Schäfer, Norbert. Nat Spiel- und Erlebnisräume. Planen. Bauen. Gestalten. Luchterhand. 1999 ISBN 3 472 03719 9. For more examples of this work.

implies the awareness held by the children for some equal intelligence beyond the human sphere. The adults showed respect of this larger force of nature in their inclusion of this unrefined element. This is an example of the transference of symbolism. The cut off tree acts as the transmitter for a value of nature and in so doing, becomes a symbolic representation of the force, which creates it. Several other examples are listed from the Weimar children's playground proposals:

The Bush/treehouse: The Rathenau School Group D commenting on Group C, regarded a bush as a treehouse. In this case, the bush is an available facility for a treehouse-like experience. It has become a symbol of a type of experience.

Treehouse and Archway: Group B of the Rathenau School portrayed their ecological understanding of the man/nature relationship. The arching structure over the tree and the treehouse, are the symbols of this.

The Blackboard: This edging proposal is a symbol of the child's need to establish defendable boundaries. The children subconsciously chose a barrier which is user-friendly (multipurpose) but clearly defines a separation between the realm of the child and that of the adult. The children have learned to defend their needs in a non-threatening manner to the adult world.

The Fence: The propositions for the fence repair involved creating a new resource as a response to damage. The fence was transformed into a climbing frame. The children showed compassion in understanding the needs of the teenagers. Their proposal acts as their arbitration of the misunderstanding between the teenagers, the adult world and themselves.

The Tunnel: Camouflaged and hidden in the earth, the tunnel became the symbol of the children's new-found connection to their chosen place.

These examples illustrate the child's ability to read and interpret their environment as texts, embodying cultural messages, which they themselves have constructed (operatively), or inherited (figuratively). Symbolic meaning enables the child to adapt to

the changing environment. The children impart objects with meaning, thus incorporating them into their cognitive structures. The tunnel is a built form created to express the children's connection of rootedness with their place. The blackboard is a sign to express the children's need for security. The fence is an expression of inventiveness whilst acknowledging the need for challenge. The treehouse and archway signal the ecological stance of the children, the bush/treehouse signals inventiveness and the child's acceptance of natural elements as appropriate.

Two things can be gleaned from this: The first, that the thoughts, suggestions and representations of children can be analysed with the knowledge that these are valid expressions of personal needs, and awareness of place. This symbolic language is used a detailed knowledge of the cultural and physical issues acting on that locus can be developed.

Secondly, the symbol as an image, is the product of the child's cultural inheritance. As such, the representations act as the reference point of the Chapter 3 model. The child has obtained her symbolic language through the structural coupling interaction between cultural inheritance, physical environment and genotype. Each process of coupling results in a modification to both sides. This modification takes the form of symbolic interpretation as the experience is stored in the cognitive structure. When children have access to environments of natural physical diversity (such as the Hütschenhausen Kindergarten), the experiences will be predominantly construed from natural elements.

Two areas of application present themselves: Planners can use the symbolic knowledge of children to gain a deeper understanding of the processes operating in the environment to be planned. Using such participative methods, planners can access a rich source of knowledge based on systemic interrelation within the physical and cultural environment.

The planner can therefore interpret this into a design, which will be rooted in the cultural and physical context. This is known as *Locus Architecture.*[7]

The second application is to view such symbolic representation as a measure of the child's learning development and as a means for the child to become consciously aware of processes within her natural and cultural environment. Symbols are holistic representations of the knowledge acquired by the child from her environment. As such, this field could be expanded to teach and measure ecological consciousness. Additionally, the representations can be used to measure (as we did in the tables), the quality of the environments in which these children are living.

Recommendations/Applications

: Proposals for Planning Practice

One of the major findings reached at is that children will seek out that which they need beyond the confines of the playground. Children feel the need to be empowered within their environment. Static traditional play environments are based on the outmoded assumption that the child still has access to a wide range of environments. These needs are provided for through planning, what is this planning type? Based on the analysis gathered, a formula for creating environments, which are appropriate, for the child's development could be read so:

- Define the needs of the child/children: through application (and adaptation, according to user group) of the methodology outlined in Chapter 5 Methodology.
- Analyse this cumulative, participative discovery of the environment according to the list of variables generated above.

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[7] See Locus Architecture. Dr. Faozi Ujam. Diploma Msc MArch Courses at the Heriot Watt University.

- Define where discrepancies of available experience lie, between the local environment available to the child, and a model environment (such as presented in the Hütschenhausen Kindergarten and the eight variables of place).
- Identify experiences required to fulfil these needs; from the analysis of the children's work and the palette of possibilities from the model environment (bearing in mind, the *coded* and *un-coded* experiential texts of the environment).
- Plan for these experiences within the contextual limits of cultural, climatological, geographical, economical and resource availability factors. Bear in mind that some of these limits will require adaptation in order to fulfil the needs of the child and create environments, which lead to the formation of an ecological consciousness.

This reads as a recipe for child-orientated environmental design, it will vary according to the personalities of the users, and the available ingredients. Active participation of the users of the environment ensures that the outcome will satisfy their needs. Indeed, this is a process, which finds no end. The structural coupling theory of Maturana and Varela acknowledges this interrelation: the environment changes, the children develop, they in turn change their environment, ad infinitum....

The children have demonstrated an intimate awareness of issues of place and the man-nature relationship. This qualifies children to become designers of their own environment when given adequate assistance and a high level of genuine participation. This generates evidence that there is no need to TEACH a child to relate to the natural environment. What is needed is the recognition of this sensitivity and knowledge held within children, by the adults who determine the structure of their world. Children require a stage upon which they can act out their knowledge. The more facility is generated for this, the more will these values of a holistic system of man in nature be reinforced.

The task of the adult (planner) is therefore to prepare a forum for the child's expression and facilitate the environmental enquiry. Then the environment can be prepared (built) for

the child so that this knowledge may find a natural outlet, and the process of conscious environmental bonding be reinforced. Through such drawings and other forms of communication, the planner can learn to read the child's instinctive ability to act within nature as part of a holistic system.

: A Methodology for Planning

Practicing Symbolic Interpretation: Raising the Child's Awareness of the Environment

The thesis was directed by the observation that if children are to be able to express a more profound relationship towards their environment than their parents, methodologies for the enhancement of this relationship need to be developed. In the text above we outlined and referred to many complementary possibilities. This section aims to develop one strand from this which was clearly illustrated throughout the text. This is the development of the child's inherent manner of classifying her environment through the language of symbol.

The analysis of the Weimar children's drawings revealed much of a common language of the subconscious which became expressed in the children's renditions of home and neighbourhood. The observations of the Hütschenhausen Kindergarten principal, her staff and the planners, Stadt+Natur confirmed the child's symbolic reading of place. Kaplan's place preference, and Titman's semiotic readings of school grounds, are two examples of the wealth of information to be gleaned from the language of symbolism. The following text is the author's proposal to take this research and practice of awareness-raising a step further.

The process proposed by the author for increasing the child's awareness of her/his place in the environment can be expressed as such:

FAMILIARITY

The child builds emotional affinity over time through direct experience

NAMING

The children name the symbols in their environment using words, pictures, models, or showing in the field

OBSERVATION

Adults observe the child's use of their play context, and evolving needs over time

SYMBOLS

Children draw pictures, after discussions about play, ideals, hopes, and disappointments

IDENTIFICATION OF SOLUTIONS

Bringing the children's subjective thoughts into consciousness through analysis

APPLYING KNOWLEDGE

Re-creating the environment through participative action

EVOLUTION OF NEEDS

Sustainable development through feedback processes

PSYCHOLOGICAL SUPPORT

Facilitating a new consciousness among the adult participators.

EDUCATION OF ENVIRONMENTAL AWARENESS THROUGH A CYCLICAL PROCESS OF EXPERIENCE, OBSERVATION, CONTEMPLATION, EXPRESSION, ACTION AND REFLECTION. TABLE Q

What follows is a description of this methodology if used in a kindergarten context.

FAMILIARITY

This first stage involves the child making a connection to her environment based on experience. At this operative stage the child is encouraged to interact with his environment, through active play, in groups or alone. When working with kindergarten children, the choice of activity will be different from older age groups. The kindergarten-aged child is most sensitive to hands-on experience. A typical kindergarten environment offers opportunities of playing with sand, water, climbing equipment, open space and small enclosures. The better-endowed kindergarten will provide the children with access to a wide range of these basics for use outside. Large quantities of unstructured materials (plants, logs, stones, building material, hard/soft objects, shells, coloured manufactured materials etc.[8]) and structured materials such as bicycles, trikes, balls, skipping ropes etc, are ideal starting points.

If the child is to engage in the process of building affinity to this environment, then she must be given the opportunity to choose and direct her experience. Whatever her choice, it requires support and occasionally encouragement from those adults who are responsible. Once the kindergarten has consciously chosen to begin this process it must be prepared to support the children in their own choice. The place of the adult is to act as an un-biased observer whose job is to ensure that no child harms herself or is harmed by another. This requires a large quantity of trust in the judgement of the child – such as honoring the child's decision to climb a tree, and equally honoring the child's responsibility to herself to find her own way down. The learning (explored in the Perception/Assimilation Model of Non-Directive Learning) in such an environment, builds up emotional affinity with the place of experience. The child forms an attachment to the place.

[8] See Wild, Montessori, and the Reggio Emilia approach for full explanation of the nature and necessity of this diversity.

NAMING

The next stage is to bring this learning into the area of conscious thought. The children would be asked to name their environment. That is, a name is given to each aspect of the environment. The lilac bush that the adults see is called the 'house', an empty corner is the 'lonely space' etc. In kindergarten aged children this is best done through observation of the children as they play. Using a simple plan of the kindergarten grounds, the observer can annotate the different functions given by the children and the accompanying names. Children personify their environment, often favouring a particular element with a gender classification. All of these are important to gain understanding into the manner of the relationship. Additionally, the children can be asked to *show* their kindergarten to the adult, giving their own descriptions and classifications. This can be backed up by their drawings of the kindergarten. In order to maintain a satisfactory level of participation, the children have to be informed of the adults' wish for improving their environment. The adults should openly state their intention: that the children form a strong attachment to their environment. In the same way that it is the adult's responsibility to ensure that children learn to be with each other in understanding and harmony, the adults can explain the process of caring for the environment. Once children realize that the environment is taken seriously, they respond by expressing their natural affection with more demonstration. This openness is essential to the process. Without the *democratic governing process* the children will find any way to expose any form of manipulation by the adults, and this usually takes the form of destruction or refusal to cooperate.

OBSERVATION

The form of observation used by the initiating adults can be copied from the Wild's method at the Pestalozzi School. The staff usually accompanies the children with a small notebook, where they note new developments among the children and record particular events. This information is ideally located on the map of the kindergarten to associate

activity with geographical location and resource. This stage is valuable, particularly if carried out over a period of three to six months- ideally; it would be a continuous part of the curriculum. Observation places a safe distance between the activities of the child and interfering adults. Piaget's recommendation that the researcher utilise a number of methods is valid. One problem of relying upon observation is *the difficulty of distinguishing a child's play from his beliefs,* the second is, *the child neither spontaneously seeks nor is able to communicate the whole of his thought.*[9]Mapping the children's associations with place over a period of time will give indication of the child's interpretation of her environment. It is this interpretation which plays a vital role in the value which the children give to their experience of place. If an element in the environment reveals itself as a constant carrier of negative connotations then changing this element, by way of a transformation directed by the children themselves could leave long-term constructs of empowerment in the minds of the affected children.

SYMBOLS

This stage can be embarked upon parallel to the process of observation. Ideally, the children would be asked to draw a picture of their kindergarten every week. One way to access the children's thought on aspects of the environment is to read a story or fairytale, which obviously concerns itself with matters of the environment. [10] After this, the children can be asked about their impressions, excitement, boredom and dissatisfactions with their environment. After a discussion the children can simply be asked to record their feelings onto paper. When these pictures are coupled with the observation map, a huge resource of perception is available to the planner. A language of symbols can be distilled from this data.

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[9] See Pages 6 and 7, Jean Piaget, The Child's Conception of the World.1929(1951reprint).Routledge

[10] The anthroposophical movement originated by Rudolf Steiner has huge collections of fairytales, which are concerned with ecology).

An additional manner to access the children's emotional connection to their environment would be through their own direct subjective evaluation. Using flags bearing a range of agreed upon symbolic images (sunshine, clouds, lightning, rabbits, broken bottles etc.), the children would place them into the earth of the corner to which the emotional property applied. In this way, perceptual maps could be created.

There are still many practitioners of participatory planning who believe that getting children to produce a model of their dream playground is enough. The result of this approach however, is that generally children reproduce that which they have seen elsewhere. To reach an understanding of their place in that environment, the children have to access their first hand experience and be given a way to express this.[11]

Such planning needs to be recognized as not simply the cosmetic alteration of a place to *function* better. Restructuring an environment for children has the potential to explore the most profound experience of connection between the child and his natural environment. The planning process is expanded into the field of generating ecological consciousness, of personal empowerment, and of valuing the force of the subjective in our interpretations and structuring of our world. Such a simple task can become a method whereby children come face to face with the origins of cultural adaptation. By rendering the process of perception transparent through the drawings, observations, and naming, the children are confronted at an early age with the reality that each one of them holds a different construction of the world about them. This, coupled with the knowledge that, despite this, children can still act as social beings playing according to agreed rules, is a small lesson in tolerance for the environment and each other.

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[11] See the Zukunftswerkstatt (Future Workshop) approach as an example of successful participative planning.

IDENTIFICATION OF SOLUTIONS

The fifth stage in this process is to filter out the most frequently occurring symbols used by the children in relation to their environment. From these, the planner can begin to assess the changes necessary to be made to the environment and those places, which should remain, untouched or slightly enhanced. Functional problems such as overuse or underuse of certain spaces and facilities, abuse of equipment require addressing. In addition, the children's interpretation requires assessment. Change should only be made to those areas, which disturbed the children, or which displayed an obvious lack of stimulus.

The maps, drawings and symbol names and positions form the raw analytical material for the planner's decision as to alterations to be made to the learning environment. These, coupled with an ecological audit of the internal and external learning environment generate the brief for the planners. The audit would cover all aspects of resource consumption, waste and recycling occurring in the environment. The resultant plan would form the structure of an environment catering to the needs of the children and the needs of the environment.

APPLYING KNOWLEDGE

The planner produces a finished concept, which is then checked with educators and the children. A model is the ideal form of presentation. The alterations are then built by children, parents and educators in a series of participative construction weekends (this does not exclude professional builders for the groundwork), managed by the planners. Those involved in the building, create strong emotional attachments to their creations, which are later manifested as care for the built elements. Participative building allows for a flexible interpretation of the planner's conclusions. The finished environment is a collective creation, with room for subsequent adaptation.

Local firms are used for construction and materials thus reducing transport costs and strengthening the social ties within the local community.

Alterations to the environment would be made so that on completion all technical processes are visible and experiential. Internally, this could include exposed pipe systems, accessible photovoltaic cells, and exposed structural and insulation sections within the building structure. Externally, precipitation collectors, manual water pumps, organic waste re-processing, miniature water or wind turbines and water purification systems could be included.

EVOLUTION OF NEEDS: FEEDBACK

This reflective stage can be viewed as the end of the process, or the beginning of the next. The entire process can be re-cycled, allowing for adjustments, for redefinition, and accommodating the developments of the children. The altered environment will be tailored to the needs of one particular group of children. Not only will their needs evolve over time, but different children will have varying needs. The constructed environment provides a stable long-term structure, within which there is space for individual alteration and flexibility of interpretation. Experiential learning within such an environment, where natural and man-made systems are transparent and where emotional, intuitive responses are validated will empower children to act responsibly within their environment. Such flexibility allows for a glorified form of structural coupling between the environment and the children.

This process can be seen as the legitimization of the child's subjective view of her world. Language, our ancestors' inheritance, tells us that, although strongly repressed today, every noun had its own subjective value. 'Moon' was either a he or a she, obtaining her identity through the shared perception of the creators of our language. So it is with physical form.

The process above acknowledges the deep roots of emotional connection to place. The research in the thesis analyses some of the effects of emotional attachment, for the child

as he is and for his potential actions in the future. Through the language of symbol we can come closer to the child's perception. Understanding how children feel by illuminating the cause and effect motivates action. Such processes can equally validate adult's unexpressed discomforts experienced in particular environments. Processes of this type can begin to define a new way to relate to our external environment; one based on the awareness of our place and function within it.

PSYCHOLOGICAL SUPPORT

Children and adults value that for which they have invested energy. Using non-directive participative methods, where children can explore their own personal relationship to their environment, can encourage this value. Educators, planners and parents involved in such a project are given the opportunity to understand the child's perception of the objective and subjective elements of the environment. This leads to an intensified experience of place for all concerned. It is wise to accompany the project with a series of seminars which aim to re-establish contact to the participating adult's place experience as a child. If the adults are genuinely interested in reforming their children's environment, they need to be able to see and accept the child's needs and perceptions free from prejudice and judgement.

Postscript

Super-industrialised culture chose to abandon the image of nurturing nature, compounded in myth and the ritual of cultural practices preached by Aristotle. The philosophy of nature has, since Descartes proposition of dualism and the mechanistic model of scientific investigation, invoked an inexorable descent into the notion of nature as fiend and not friend. Separating objectifying man from the chaos surrounding him, and raising him to the pedestal of those beings of consciousness, the culture of the Western world has set us at constant odds with the environment of our origin. Positivism and existentialism of the twentieth century acted as a philosophical framework, which supported the discovery of many scientific break-throughs. But science has since come full circle and is demanding a new ethos of systems thought which reaffirms our interdependence on and with nature. Al Gore put it simply in the context of the man/nature relationship: *The problem is not our effect* on *the environment so much as our relationship* with *the environment.....the real solution will be found in reinventing and finally healing the relationship between civilisation and the earth.*[12]

Western culture possesses a treasure house of scientific exploration, which can be used to mend or break this delicate line of contact to the natural world. The impact of quantum physics or systems theory is infiltrating aspects of scientific research once solely the domain of dualistic thinking. Both these *philosophies* are however serving to propel western scientific thought into an era of inter-relation. Systemic and holistic thought are not far removed from one another. Mechanistic scientific investigation has produced an alien offspring: quantum physics, at once refuting the principles of its parent but confirming also the validity of the mechanistic approach by the fact that it has produced a result. The discovery that there are no finite bounds to matter, which is in fact, strings of

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[12] Gore, Al. Earth in the Balance. Earthscan. 1992 Pages 34-35

energy wavelengths, is sufficient to indicate relationships of interdependence between *individual* elements. Systems science is revealing a new relationship to nature, the definitions of anatomic relationship are becoming ever wider.

Ironically, it is this awareness of integration and interrelation, which has been maintained by many of the indigenous cultures of the Earth. The Navajo, the Hopi, the Wet'su'wet'an, to name just a sample, have held on to the centrality of nature and the notion of communication between all aspects within her, through their myth and ritual of culture. The western world abandoned such heritage, choosing to investigate this relationship themselves. During the tortuous struggle ensuing, (this struggle is currently playing out on the global experimental field), scientific *evidence* is gradually coming to affirm some of these *primitive* views.

The cry of a *valueless* society must be meaningless. What we should instead understand is that we have values, they do not however bear much relation to the environment that we can label as sustainable. The values are the product of a formation dependent on the needs generated by the present western society's mechanistic model and its resultant technological revolutions.

Living in harmony with such a dynamic system as our natural environment makes it essential that we learn to operate with the same dynamism. The systems of ecology must, as Capra says, be the starting point for a relationship to this environment, if we do not wish to continue on our collision course with the rest of evolution.

The science of quantum physics, of molecular biology, and of ecology, embody these principles of a dynamic system. It follows too, that our relationship to the ecology of the planet will embody the principles of structural coupling, of homeostasis and of development. We have a chance to free ourselves of the shackles of outmoded static philosophies, and engage instead in a dialogue between man and the environment whose principles are those of homeostatic balance, in a process of gradual evolution.

What is sustainability – if nothing more than our ability to hold our own within the rest of creation? We now know how our fate is dependent on the delicate balance between the physical realities of our planet. The increased ferocity of tornadoes, the warming El Nino ocean current, for example not only affect our civilisations destructively, but our actions have called this destruction to us by the changes in balance within the world climatological system. (Such as caused by deforestation, precipitation increase or decrease erosion, melting ice, world temperature changes etc.)

Sustainable development can be nothing more or less than the action taken to redress these imbalances within the natural systems. There are two forms of action: causing fewer imbalances in the first place, and taking positive action to reduce and reinstate the balance. To do this we can call a halt to our present actions and asses what aspects of these we decide to lay aside. We can also engage in a new dialogue based on communication with this affected environment. As we have learned from Piaget, not merely reflecting about a thing, but through actively experiencing it creates knowledge. We need to identify ways of encouraging this communication process, by way of providing the opportunity for action. In this way, we can avoid slipping into the mire of another unsuccessful *eco ethic* laid over us from some hidden hierarchy of scientific measurement. Each one of us can begin this dialogue for him or herself within the environment.

The power to influence this process rests in the provision of types of action available. We can, restrict the palette of available experience, reducing our communication channels to their narrowest span. The focus of our society on technological advancement has threatened to do this through the reliance on specialist information, which is absorbed, but without critical action.

Our other alternative is to increase the palette of environmental diversity, creating the synergy of the rainforest effect. This richness gave birth to new diversity through the natural processes of competition for habitats, and the climate became stabilised as a

result of the establishment of a dense tree cover. The symbiotic relationships of plants and animals reached a self-perpetuating intensity of ecological diversity.

If we decide to take the second path, and re-diversify and enrich our environments, then we will be setting the seeds for an ecological game played out before us. Through its very dynamic, it becomes self-sustaining. We have more access to experience, we act in, on and are acted upon by this diversity and in so doing, we entwine ourselves in the structure of an ecological network of interrelation.

Appendix 1

The United Nations Convention on the Rights of the Child

Freedom of Expression

Article 12

1) States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.

2) For this purpose, the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child, either directly, of through a representative or an appropriate body, in a manner consistent with the procedural rules of law.

This article has implications for the kind of decision making processes which generally occur behind the back of the child, particularly in the field of what, and how they learn. The article suggests the expanded extent of the child's influence in bringing about change to those bodies responsible for their learning.

Article 13

1) The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of the child's choice.

2) The exercise of this right may be subject to certain restriction, but these shall only be such as are provided by law and are necessary:

a) For respect of the rights and reputations of others; or

b) For the protection of national security or of public order, or of public health and morals.

This has implications for the activities engaged in by children during their education and daily involvement in their community. Potentially this clause empowers children to become active forces in shaping the form and cultural content of their environment. It gives also the responsibility to the adults in power to set limits where behaviour or actions could cause danger to others.

Freedom of Thought, Conscience, and Religion

Article 14

1) States Parties shall respect the right of the child to freedom of thought, conscience and religion.

2) States Parties shall respect the rights and duties of the parents and, when applicable, legal guardians, to provide direction to the child in the exercise of his or her right in a manner consistent with the evolving capacities of the child.

3) Freedom to manifest one's religion or beliefs may be subject only to such implications as are prescribed by law and are necessary to protect public safety, order, health or morals, or the fundamental right and freedoms of others.

This holds implications for allowing the child to develop her or his own consciousness, without the application of external directives. It also recognises the child as a social being contained within the vessel of his family, who are a major force in the type of constructs formed by a child.

Freedom of Assembly

Article 15

1) States Parties recognise the rights of the child to freedom of association and freedom of peaceful assembly.

2) No restrictions may be placed on the exercise of these rights other than those imposed in conformity with the law and which are necessary in a democratic society in the interests of national security of public safety, public order, the protection of public health or morals or the protection of the rights and freedom of others.

This holds implications for activities children may undertake within their community. It implies a removal of class barriers to the child's freedom of association and the possibility of encouraging personal and cultural exchange between parties.

Access to Information

Article 17

States Parties recognise the important function performed by the mass media and shall ensure that the child has access to information and material from a diversity of national and international sources, especially those aimed at the promotion of his or her social, spiritual and moral well-being and physical and mental health. To this end, States Parties shall:

a) Encourage the mass media to disseminate information and material of social and cultural benefit to the child and in accordance with the spirit of article 29:

b) Encourage international co-operation in the production, exchange and dissemination of such information and material from a diversity of cultural, national and international sources;

c) Encourage the production and dissemination of children's books;

d) Encourage the mass media to have particular regard to the linguistic needs of the child who belongs to a minority group or who is indigenous.

e) Encourage the development of appropriate guidelines for the protection of the child from information and material injurious to his or her well-being, bearing in mind the provisions of articles 13 and 18.

Special Support for Disabled Children

Article 23

1) *States Parties recognise that, mentally or physically disabled children should enjoy a full and decent life in conditions, which ensure dignity, promote self-reliance and facilitate the child's active participation in the community.*
2) *Education for Personal Fulfilment and Responsible Citizenship*

This gives equal status to disabled and non-disabled children. There is no reason to assume that disabled children are not equally able to assume a sense of responsibility for their environment and to take an active role in its care.

Article 29

1) States Parties agree that the education of the child shall be directed to:

a) The development of the child's personality, talents, and mental and physical abilities to their fullest potential;

b) The development of respect for human rights and fundamental freedoms and for the principles enshrined in the Charter of the United Nations.

c) The development of respect for the child's parents, his of her own cultural identity, language and values, for the national values of the country in which the child is living, the country from which he or she may originate, and for civilisations different from his or her own;

d) The preparation of the child for responsible life in a free society, in the spirit of understanding, peace, tolerance, equality of sexes, and friendship among all peoples, ethnic, national and religious groups and persons of indigenous origin;

e) The development of respect for the natural environment.

2) No part of the present article or article 28 shall be construed so as to interfere with the liberty of individuals and bodies to establish and direct educational institutions, subject always to the observance of the principles set forth in paragraph 1 of the present article and to the requirements that the education given in such institutions shall conform to such minimum standards as may be laid down by the State. Education for Personal Fulfilment and Responsible Citizenship

These are the ideals, which propel the search for learning processes, which can fulfil the concept of creating a climate of personal and collective environmental responsibility.

Play and Participation in Cultural and Artistic Life Article 31

1) States Parties recognise the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.

2) States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity.

This freedom of access to knowledge acts as an empowering tool along the path to responsible action. It also implies that children have a right to as broad an experience base as is possible, that no limits should be set to their demands for knowledge, and that these needs be recognised as valid demands.

c *Play and Participation in Cultural and Artistic Life Article 31*

1) States Parties recognise the right of the child to rest and leisure, to engage in play and recreational activities appropriate to the age of the child and to participate freely in cultural life and the arts.

2) States Parties shall respect and promote the right of the child to participate fully in cultural and artistic life and shall encourage the provision of appropriate and equal opportunities for cultural, artistic, recreational and leisure activity.

The right to participate in all areas of life is the strongest common current running through the charter. As the largest and most common denominator in our world affairs, the United Nations was intended to act as a spokes-person for the world, as a melting pot for all the ideals and struggles of its member nations. If we take the stance that the United Nations Charter is representative we may adopt the charter as a steering mechanism for the question of environmental responsibility.

Appendix 2

Case Study 3: Hütschenhausen Kindergarten

Analytical Comparison to the Agenda 21 Articles

Those articles pertaining to political decisions or special interest groups were omitted. For the benefit of the reader, the Agenda 21 articles are paraphrased and the conclusion as to applicability is noted below each article:

Consumption

Articles 4.5, 4.8 and 4.11 Efficient resource use, changing patterns of consumption. Developing new strategies for an improved standard of living, which is nonetheless sustainable.

The planners showed how, with little money, a diverse, ecologically rich environment could be created using natural materials and recycled materials: willow and household objects could be turned into play structures. Where previously several different toys would have been provided, natural materials allowed for diverse interpretation and application by the children in their play. Toys as such began to become superfluous, and then, valued more strongly for their own particular characteristics. The kindergarten is an example of lateral thinking, operating within the confines of ecological consciousness and monetary restrictions.

Articles 4.18 and 4.19 Reduction of material and energy use. Reduction of waste.

The kindergarten grounds are almost self-sustaining. The *toys* grow in the environment. Due to natural compost fertiliser, the system is closed. The children learn to use less water indoors, they do not require so many manufactured articles, and the waste they produce is recycled.

Evidently this situation could be improved upon, were for example, the sewage water to be reprocessed on the site, or rainwater harvested and purified for drinking. These were not embarked upon for reasons of cost and lack of space.

Article 4.24 Changing to environmentally friendly price setting.

The planners required a higher fee than is normally expected: In return for specialist human resources, they guaranteed lower prices for construction through participative action.

The economic bias was placed on labour costs, on time and expertise. Planning a participative environment where many voices are to be integrated on a low budget requires time.

Article 4.26 Encouragement of environmental consciousness.

Active participation in the building and maintenance of the kindergarten caused a large number of people to come into contact with the natural environment. Both the attending children, their parents and the wider community had the option of experiencing the consequences of their actions through active involvement and in observing the effects of this involvement over time.

Health

Article 6.9 Increased emphasis on the responsibility of the community for their own health and well being.

The parents and educators wished to offer a better quality of experience to the children, and consciously decided to alter the kindergarten environment. By taking on responsibility, they recognised the inadequacy of the previous environment.

Article 6.18 to 6.20 Children and youth are given special consideration of their health needs.

The active kindergarten fills the identified gap in the children's motoric skills and the often, poor health associated with indoor living. Giving children constant access to the outside and providing stimulating challenges in the structure of the physical environment facilitated activity.

Planning Measures

Article 7.28 Environmentally acceptable planning and land-use. -To encourage the creation of collectively used and maintained areas. The planning process restored

damage, which had been inflicted upon the environment. Much of the original diversity of the native climax vegetation and ecology was reclaimed and improvements were made to the water balance.

The area was made accessible to all 70 children attending, who jointly held responsibility for the maintenance of the environment with the educators and parents.

Article 7.34 Training measures for sustainable planning and maintenance of the ground resources.

The water pump was a prime example of the kind of *training measure* embarked on by the kindergarten, as are collective management of the compost and planting schemes and the basic training engaged in during the construction.

Articles 7.35 and 7.44 Infrastructure, educational program and the development of human resources.

The pedagogical structure of the kindergarten is such that the learning is through action in the environment. This activity is related to the diversity of natural materials. The activities of the children (and parents and educators) are therefore centered on the use of the environment, in exploring its characteristics and its limitations.

Articles 7.67, 7.69 and 7.71 Building sustainably, using native building materials and training human resources.

The parents, children, planners and builders, came in contact with a manner of building, which is based on sustainable principles.

<u>Protection of the Earth's Atmosphere</u>

Article 9.31 Motivational strategies, at local, national and international level for the protection of the earth's atmosphere.

Building techniques and choice of materials ensured low levels of energy consumption and production of greenhouse gases.

<u>Protection and Maintenance of Ground Resources</u>

Article 10.9 Awareness development.

The children's experience of the limited nature of the water supply lead them to value ground water. Participation in building awakened the adult's interest and knowledge of the impact to the soil of compaction, non-porous surfaces, and earth movement.

Article 10.16 Improvement in training in the sustainable use of resources.

The planning and building work is facilitated by qualified landscape architects, who point out the limitations in the use of natural resources. The participative building method and maintenance acts like a training scheme for environmental awareness.

Article 11.18 c. Developing human resources to ensure the protection and sustainable development of forest areas.

The use of native timber from local woodland ensures the continuing management of those forests and therefore to an extent their protection. It was not clear to what extent these forests are managed as timber *factories* or as complete ecological systems.

Article 11.26 Develop human capabilities to manage woodland sustainably.

The educators support the children in their experimentation with plant material. Adults set limits to use only if the damage promises to be unsustainable. The children see the consequences of their management practices.

Article 14.17 Increasing awareness of agricultural practices.

The vegetable, herb garden and compost provide a means for the children to experience a mini system of organic agricultural cultivation.

Article 14.83 Sustainable plant nourishment to increase production.

The recycling of organic material into compost provides the children with the experience of seeing the enhancement of living vegetation using dead organic matter.

Biological Diversity

Article 15.5 h. Recreating damaged eco-systems.

The new planting of native vegetation restored the ecological balance of the kindergarten area. It had been run down to the state of a barren monoculture of grass and a few scrub bushes.

i. Sustainable use of private land.

The kindergarten demonstrated the restoration of a small piece of land. The effect spread to the kindergarten parents, who decided to alter their private gardens having experienced the benefit of the kindergarten grounds.

K. Introduce maintenance methods which encourage sustainable development.

The recycling of waste organic material and the experience of plant diversity (even being able to break off branches, if put to a use) leads to the development of emotional affinity with the physical environment and an understanding of the natural cycles occurring in the physical environment.

l. Consolidating and adding to the native populations of flora and fauna. And, *m. Take steps to achieve a greater understanding of the value of natural diversity.*

The native plants attract and provide habitats for wildlife; especially as the management scheme is dictated by actual use and not according to an applied aesthetic scheme based on the sensibilities of one planner. The environment is shaped directly by the users, according to their needs. As the needs are fulfilled, changes occur to the usage. The diversity of the environment ensures a natural distribution of use and wear which is sustainable.

Water Resources

Article 18.8 Meeting the basic needs

The use of water from the pump and cistern may at first appear to be wasteful, but the experience of using the water as we have seen has lead to a sustainable use of the water from the pump and elsewhere. The water captured in the cistern can be seen as a kind of investment policy to ensure the future responsible use of the resource.

Article 18.9 Planning, use and evaluation of water requirements.

The kindergarten grounds were re-structured so as to ensure the natural percolation of rainwater into the ground water table. The cistern capacity was so calculated as to collect runoff rainwater from the church roof, which would otherwise have been lost to the local

system through canalization. Another rainwater collection trough was connected to the kindergarten flat roof guttering system, and this water was used to irrigate the plants. The cistern allowed the kindergarten to be independent of the regional water supply; thus ensuring continued use of the resource to the children despite changes to the price and availability of the mains supply.

Article 18.12 Encouragement of programs for rationalised use of water through: increasing public awareness, programs of education and increasing prices. And, *Article 18.39 a. Educational measures to protect, maintain, and rationally use the resources on a sustainable basis.* And *Article 18.44 Innovative instructional methods should be developed specifically to ensure the protection of resources such as water.*

The water pump is an example of this *increased public awareness*. The educational process is afforded through the design of the environment, the attitude of the staff, and the access, which the children have to the resource. The children are free to engage in water play at any time – providing they wear suitable clothing.

Article 18.6 Water, which is a precious, easily damaged resource, should be incorporated into socio-economic development in the planning process, and *Article 18.20 Awareness encouraging programs.*

Again, we can refer to the water pump. The increase to the absorptive capacity of the soil through de-compaction and removal of non-permeable surface material would have been perceived, at least passively by those adults and children engaged in the building of the scheme possibly contributing to a raised awareness of the consequences of inappropriate use of materials.

Article 18.30 Appraisal of water resources in the area.

The planners were engaged in calculating the quantity of rainfall and run-off from the buildings. Tapping into the run-off from the church roof was an example of lateral thinking in order to serve the planning purposes.

Article 18.39 b. Preventing pollution by working at the source of the pollution problem.

Choosing untreated timber, biodegradable, non-toxic paints and materials of natural origin acted as a preventative measure to restrict the possible pollution to the water cycle in the process of manufacture and use.

Article 19.49 b. Development of guidelines to remove toxic chemicals from the choice of materials used.

Rather than risk possible future pollution and the release of toxic chemicals into the children's environment, Stadt+Natur have integrated the use of sustainable materials of natural or recycled origin into their planning philosophy.

Article 20.10 Using dangerous materials by converting them into useable materials.

The use of old tyres in the slope for the slide is such an example. The tyres would otherwise have been burned thus releasing greenhouse gases and toxins. The planners utilised the tyres' capacity to absorb impact and to retain a steep slope. The PVC drainpipe, used for the long-distance *telephone,* is also recycled thus delaying the date at which the heat and carbon dioxide released from its combustion be poured in to the atmosphere.

<u>Sustainable Practices- Solid waste and sewage disposal</u>

Article 21.16 Maximising the sustainable re-use of waste materials.

The metal xylophone created from scrap, and decorative additions to the step balustrade were such examples. The creation of compost from the gathered organic waste is another example of re-using waste. The carousel was re-conditioned; the sensory path was built from recycled materials, as was the Hercules ramp.

The water balance would have been positively affected had the grey water from inside the kindergarten been incorporated into the plant irrigation system. The kindergarten had already been built and the expense of such conversion was not given highest priority.

The willow structures are an example of re-use: cuttings from existing willow plants were obtained to create the willow tunnels and teepee. The cuttings would otherwise have been

shredded for mulch. The resource was used to create something new with little alteration to original structure.

Science in the service of sustainable development

Article 35.10 Deepening the scientific understanding: to encourage sustainable development programs, a broader knowledge about the capacity of the environment to adapt to stress (carrying capacity), is needed.

Active learning equips the children with first-hand knowledge of a variety of natural processes. The child develops an emotional affinity based on operative learning. This lays the foundation for future detailed study of the systems of ecology.

School education

Article 36. Education is an indispensable requirement for the encouragement of sustainable development and the improvement of the population's ability to relate to the environment and questions of development. Formal and non-formal educational methods are essential tools for raising conscious awareness so that people can direct their concern to the issue of sustainable development. Education is also important for the creation of an ecological and ethical consciousness, which forms values, attitudes, abilities and behaviour, which are consistent with sustainable development.

The planners and kindergarten staff aim to encourage the development of this ecological, ethical consciousness through immersion in this prepared environment. The coded messages of the hidden curriculum, listed above indicate the agenda towards which the staff strive.

Appendix 3

Variable Tables Case Studies 1+2

Lucas Cranach School: Albina

A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
		X	X			X			X	X	X	X						X	X	X	X	X		
CHALLENGE			INVENTIVE-NESS			NURTURE			PROXIMITY			ROOTEDNESS			MYSTERY			SECURITY			COHERENCE		
		New equipment				Window detail			Home	Near home	Near Home	Doorway figure						Window detail	Look-out towers	Open space	At house	'Fort'		

X	X	X		X	X																			
Man/Nature		separatio	Man	ordering		Man	protectin	g against	Man	maintain	ed and	Nature/	Human	co-	Superior	benevole	nt nature	Nature	overpow	ering	Shameful	man in	nature	
House dominates	Two planes	Black, angular		Fort dominates	Even spacing																			

Laura and Lydia

| | | |

Plants contained	Man/Nature separatio	X
Periphery green		X
Trees decorative		X
Planned environment.	Man ordering	X
Structur, manmade		X
Constructed environ.		X
Houseplants	Man protect-ing	X
Nature delimited		X
Fence for dogs		X
Small plants	Man and wild nature	X
Wild nat. absent		X
Fastidious environ.		X
Cultivated nat.	Nature/ Human co-	
Nature absent		
Trees accepted		X
Cultivated nat.	Superior benevolent nature	
Nature absent		
Nature absent		
Cultivated nat.	Nature overpowering	
Nature absent		
Nature absent		
Cultivated nat.	Shameful man in nature	
Nature absent		
Nature absent		

Missing	CHALLENGE Triggers for	
Contrast of exp.		X
Climbing possible		X
Missing	INVENTIVENESS : Creative	X
Autonomy		X
New inventions		X
Missing	NURTURE and the maintained	X
Wasteland		
Lavish structures		X
Missing	PROXIMITY	
Far from home		
Far from home		
Missing	ROOTEDNESS	
Free claim to own		X
Personal comments		X
Missing	MYSTERY	
Unpredictability		X
Spatial structure		X
Missing	SECURITY (LEGIBILITY)	
Unpredictability		
Level hierarchy		X
Missing	COHERENCE	
House -landmark		X
Spatial structure		X

Missing	Man/Nature separatio	
Decay/ revegetate		
Integrated field		
Missing	Man ordering	
Decay/ revegetat.		
New structures		X
Missing	Man protect-against	
No maintenance		
Nature integral		
Missing	Man and wild nature	
Self-seeded		
Nature integral		
Missing	Nature/ Human co-	
House in nature		X
Nature integral		X
Missing	Superior ben-evolent	
Nature integral		
Nature integral		
Missing	Nature overpow-ering	
Nature integral		
Nature integral		
Missing	Shame-ful man in nature	
Angry graffiti		X
Nature integral		

Mario

Garden	CHALLENGE Triggers for	X
Unlike existing		X
Plan view	INVENTIVENESS : Creative	X
Colour,combination		X
Garden and sand	NURTURE and the maintained	X
Home +Neighbour	PROXIMITY	X
		X
Soil, flowers etc.	ROOTEDNESS	X
Partly shown	MYSTERY	X
Place knowledge	SECURITY (LEGIBILITY)	X
Space defined	COHERENCE	X

Man in nature	Man/Nature separatio	
Manmade forms organic		
Planned garden	Man ordering	X
Nature/man balance		
Planting beds	Man protect-ing	X
No sign of danger		
Nature controlled	Man and wild	X
Tree on separate plane	nature	X
House in nature	Nature/ Human co-	X
Tree + frame, 'planted'		X
Man controls	Superior benevole nt nature	
Tree undamaged		X
Man controls	Nature overpow ering	
Man in nature		
Man controls	Shameful man in nature	
Vandalised swing		X

WALTHER RATHENAU SCHOOL

Michi

No indication	CHALLENGE Triggers for	
Missing		X
Role playing		
Context hidden	INVENTIVENESS : Creative	X
Missing		
Additional fort		X
'Cold' colour	NURTURE and the maintained	
Missing		
Litter present		
At home	PROXIMITY	X
Missing		X
Far from home		
"My House'	ROOTEDNESS	X
Missing		
Michi + friends		X
Blank windows	MYSTERY	
Missing		
Hidden rooms		X
Home labelled	SECURITY (LEGIBILITY)	
Missing		
Guard patrol...		
Flat/door label	COHERENCE	
Missing		
Fort structure		X

Absent nature	Man/Nature separatio	X
Nature integrated		
Absent nature	Man ordering	X
Structure		X
Closed windows	Man protect-ing	X
Nature integrated		X
Nature absent	Man and wild nature	
Nature integrated		
Nature absent	Nature/ Human co-	
Tree integrated		X
Nature absent	Superior benevolent nature	
Tree integrated		
Nature absent	Nature overpowering	
Tree integrated		
Nature absent	Shameful man in nature	
Tree integrated		

At t home	CHALLENGE Triggers for	
Secrecy/ independ.		X
Colour chosen	INVENTIVENESS : Creative	X
Timber/tree combination		X
Chimney smoke	NURTURE and the maintained	X
Growing structure		X
At home	PROXIMITY	X
Far away		
Smoke: house lives	ROOTEDNESS	X
Structure 'grows'		X
Two house parts	MYSTERY	X
Secure 'hides'		X
Clear structure	SECURITY (LEGIBILITY)	X
Defined limits		X
Form hierarchy	COHERENCE	X
Play structure		X

Terence

Sky integral	Man/Nature separatio	
Missing		
Nature absent		X
Sky integral	Man ordering	
Missing		
Nature absent		X
Large wall	Man protec-ting	X
Missing		
Fortress...		X
Absent nature	Man maintained and	
Missing		
Absent nature		
Surrounding sky	Nature/ Human co-	X
Missing		
Absent nature		
Absent nature	Superior benevolent nature	
Missing		
Absent nature		
Absent nature	Nature overpowering	
Missing		
Absent nature		
Absent nature	Shameful man in nature	
Missing		
Absent nature		

Tim

Neighbour house	CHALLENGE Triggers for	
Didn't like existing		X
Sand pit	INVENTIVENESS : Creative	X
Graffiti painters		X
Adult car-parking	NURTURE and the maintained	
'Please don't write'		
At home+neighbourhood	PROXIMITY	X
Near home		X
No signs of owners	ROOTEDNESS	
Single flower		X
Roads dominate	MYSTERY	
Under the rainbow		X
Place for cars	SECURITY (LEGIBILITY)	
Sign-post		
Road dominates	COHERENCE	
Rainbow forms place		X

Sky as context	Man/Nature separatio	X
Plants integral		
Sky surrounds	Man ordering	X
Large structures		X
No wild nature	Man protec-ting	
No wild nature		
No wild nature	Man and wild nature	
Natural plant growth		
Sky as context	Nature/ Human co-	
Balance:		X
Passive sky	Superior benevolent nature	
Live/dead timber		
Passive sky	Nature overpowering	
Balance:		
Proud house	Shameful man in nature	
Balance:		

Toni

Secure home	CHALLENGE Triggers for	
Climbing combination		X
Context - sky	INVENTIVENESS : Creative	X
New structures		X
Window detail	NURTURE and the maintained	X
Flowers. Litter tidy		X
At home	PROXIMITY	X
Far away		
Heavy -keep out	ROOTEDNESS	X
Picnic site		X
Door and fence	MYSTERY	X
Overhead tunnel		X
Secure house	SECURITY (LEGIBILITY)	X
Spatial layout		X
Organisation	COHERENCE	X
Spatial depth		X

Sky around house	Man/Nature separatio	X
Nature dominates		
House main feature	Man ordering	X
Nature dominates		
Sturdy houses	Man protect-ing	X
Nature dominates		
Windows high-up	Man and wild nature	X
Flowers and bush		X
Nature absent	Nature/ Human co-	
Nature dominates		X
Sky around house	Superior benevolent nature	
Co-existence		
Nature absent	Nature overpowering	
Co-existence		
Nature absent	Shameful man in nature	
Co-existence		

No evidence	CHALLENGE Triggers for	
Natural elements		X
Drawing format	INVENTIVENESS : Creative	X
Treehouse, bush		X
Window detail	NURTURE and the maintained	X
Planted flowers		X
Street corner	PROXIMITY	X
Near home		X
Street sign	ROOTEDNESS	X
Child-built structure.		X
Regularity	MYSTERY	
Tangled bush, depth		X
Enlarged doors	SECURITY (LEGIBILITY)	X
Bush in foreground		X
Street corner	COHERENCE	X
Depth of scene		X

Janett

Integrated nature	Man/Nature separatio	
Man in nature		
Sky, earth + man	Man ordering	
Man in nature		
'Wild' plants	Man protect-ing	
Man IN nature		
No distinction	Man and wild nature	
'Good'vv"Bad'		X
House IN nature	Nature/ Human co-	X
'Good'vv"Bad'		
House/nature bal.	Superior benevolent nature	
Rainbow		X
House/nature bal.	Nature overpowering	
Tiny people		X
House/nature bal.	Shameful man in nature	
Tiny,'bad' people		X

Sara

Nature absent	Man/Nature separatio	X
Rainbow, tree, sun, cloud		
Man-made environment.	Man ordering	X
Polarised tree		X
Curtain-window	Man protect-ing	X
Roof of tower		X
Nature absent	Man and wild nature	X
Bird nest in pollarded tree		X
Toy hedgehog	Nature/ Human co-	
Rainbow,sun,clouds,etc		X
Nature absent	Superior benevolent nature	
Rainbow, sun with face		
Nature absent	Nature overpowering	
Friendly colours		
Nature absent	Shameful man in nature	
Clean and maintained		

Toys/friends	CHALLENGE Triggers for	X
Diversity		X
Exaggerated colour	INVENTIVENESS : Creative	X
Adapting tower		X
Roof for bedroom	NURTURE and the maintained	X
Nesting bird welcome		X
At home	PROXIMITY	X
Near home		X
Sara drawn	ROOTEDNESS	X
Sara drawn		X
Large cupboards	MYSTERY	X
Sand-unstructured		X
Viewed from doorway	SECURITY (LEGIBILITY)	X
High look-out tower		X
Exagerrated floor plane	COHERENCE	
Dominating tower		X

Glossary

Affordances: These refer to elements in the environment, which offer the potential of an experience.

Assimilation: This refers to the process whereby an experience is incorporated into the cognitive structure of the individual as a result of active and perceptive interaction with that experiential source.

Bio-feedback: This is a process, which has its origins in biological systems. It refers to the phenomena whereby a system first assimilates then reflects on its experience, subsequently adjusting its state to accommodate the experience.

Cognition: is the process of knowledge formation. It is the name given to the process of an individual interacting with the external world, and integrating this experience into the internal structures of perception. Cognition is the predominantly mental process of giving meaning to language, behaviour, cultural symbols and constructs, and the physical and metaphysical environment, which contains our actions.

Cognitive Structures: These are pathways of association held within the mind. This is the name given to the knowledge structures. It is from these knowledge structures that future reaction to experience is based. They form a constantly shifting base of knowledge modified through each interaction between the external environment and the individual.

Continuum: This is the term Liedloff gave to a culture, which maintains continuity in action within the environment. The relationship is based on evolution and not change.

Cultural Ecology: This is the term describing the manner of the relationship between a culture, and the environment in and through which that culture was formed. Cultural ecology examines the origins and development of cultural forms as a response to the conditions existing in the environment. As such, it is a holistic term, which views both

humans and the environment as part of a functioning system of interrelation and feedback.

Cybernetic System: This is based on observed phenomena whereby a process is not seen as an isolated event. In a cybernetic system, the end of one process is seen as the beginning of the next in a system of continual feedback and communication between changing states. In its most simplistic form, the cybernetic system will act as a loop; the last link in the chain of events acting as the stimulus to repeat the process from the beginning.

Democratic Governance Structures: This is Sutton's term to describe a method of communication between people (children and adults, adults and adults etc.) whereby each member has a voice, which is heard. The governance structures ensure that a forum is created for differences of opinion to be expressed. Such structures act to facilitate the expression of the individual in the medium in which that member is most articulate.

Ecological Consciousness: Capra's term expresses an awareness of the individual's relation to the systems, which operate within the environment. It is an expression of the interrelated nature of life whereby the individual consciousness is a contributor to, and affected by the systems which operate without him. Ecological consciousness fosters a holistic paradigm, whereby the individual is conscious of her/his effect on the environment in which she/he is acting.

Ecology: This is the science of the relation between the components of living systems. It denotes the relationship and position held by each element within a web of interrelation. Ecology is the science used to study what effect is incurred to the dependant elements of a system when one or more elements are changed.

Empowerment: This term denotes a process whereby an individual, or members of a society or culture are enabled to take action. Empowerment involves facilitating the natural development, of the potential to take action within human beings.

Environment, Hostile: This name has been given to a set of environmental conditions, which are antithetical to the needs of an individual, society or culture. They can be manifested in three different forms, operating on the physical, the social or the cultural planes. The hostile environment is one in which learning is either reduced, or is manifest in a destructive form; resultant action is generally non-sustainable.

Environment, Natural: The natural environment consists of those elements, which have not been created by man (although man may have affected them).

Environment, Physical: This is the sum of the elements of the environment, which are tangible. They include elements generated from natural processes: such as plants, minerals, and animals, and those which have been created as a result of man's action.

Environment, Prepared: This type of environment is conducive to learning. The prepared environment is one, which has been structured so as to facilitate the maximum quality of experience. The prepared environment can be implemented on the socio-cultural level, whereby the social climate is so structured as to facilitate a wide diversity of learning experience, which satisfies the needs of the child. The prepared environment can also be visible on the physical level whereby the physical environment is so structured as to accommodate and encourage diversity of learning. It can equally be a combination of both factors.

Environmental Affinity: This is the emotional attachment created through repeated exposure to an environment over a period of time. This attachment is particularly strong when formed as a child, in the company of another individual with whom the child has an existing strong emotional bond. It describes the fondness for a place, and the

predilection in later life to protect those places, which come close to the memory (cognitive structure) formed of this place.

Environmental Education: This is the practice of increasing awareness for issues of environmental concern. Environmental education is taught as a subject in schools, field-study centres colleges of higher education and universities. Teaching can be confined to theories of ecology, examining statistics of environmental pollution or degradation, or can be practised as direct experience. This is further divided into scientific investigation or subjective awareness-raising programmes.

Environmental Responsibility: This implies an awareness and consideration for the consequences of one's action within the environment. Environmental responsibility is based on a knowledge of the consequence of personal (and collective) activity with regards to the short and long-term effect upon the environment.

Evolution: This is the description of processes, which involve the change of state between one moment of balance to the next within an overall progressive scheme. Evolution results from an interaction between one or more unities within the sum of affective environmental factors.

Experiential Education: This school of education favours learning based on direct practical experience with a medium. This practical experience is predominantly accompanied by verbal and/or physical instruction.

Holistic: Is the paradigm of wholes. Holistic research implies that the topic studied cannot be considered in isolation to the interrelated elements within the system. This is knowledge based on the premise that the part can only be seen in relation to the whole. The whole is more than the sum of its parts, because it contains not only the parts but also the sum of their interrelationships.

Homeostasis: This is a principle of balance. It implies a natural tendency for a system to come to rest. Homeostasis is the quiet point between poles of existence in the search for a constant state.

Learning, Active: This refers to learning through action. The action is engaged in by the individual as the expression of an internal impulse to a stimuli or trigger. Action is not confined to bodily movement, but includes mental and emotional activity.

Learning, Figurative: Piaget's term given to learning through mimesis. Figurative learning describes the child's incorporation into her cognitive structure of the actions, gestures, and rituals, which constitute a culture. Figurative learning becomes incorporated into the cognitive structures when a child has developed a sufficient base of experiential perception against which the rituals and instructions of culture can be compared and subsequently incorporated or adjusted.

Learning, Operative: Piaget's description of early childhood learning involves the child interacting with concrete objects within the physical environment. Operative learning involves the child's direct experience of cause and effect through operations within the physical environment. Operative learning forms the base for figurative and connotative learning.

Learning, Connotative: This learning takes place in combination with figurative and operative learning. It is Piaget's name for the process of reflection upon past experience when confronted with a new situation in which some of the variables are familiar or at least bear a resemblance to cognitive structures already held. This learning enables the formation of abstract knowledge structures based on relationship, which are in turn based upon direct experience.

Messages, Coded: These are the signs and codes existent within the environment which are laden with intentional meaning. These are the semantics of the physical environment. For example, an element is placed within a physical environment in order

to achieve a certain effect. Such an example would be the barbed wire fence: its function is to restrict access in addition to indicating a lack of welcome.

Messages, Un-coded: These are signs, texts or semiotics, which have not been pre-determined. They arise out of 'coincidence' (in the case of natural elements we could also label this nature's misunderstood autopoesis). Un-coded messages can be interpreted in many different directions; there is no one correct interpretation to the signal.

Paradigm: A paradigm is a way of viewing the world in both the physical and metaphysical sense. It assumes a certain consensus of knowledge, which creates its own defined sphere in relation to another paradigm. A paradigm operates on a macro level, its knowledge structures influence culture, the physical environment, the social realm, the family and the individual.

Participation: This is the act of inclusion in a project. Participation assumes the input through ideas or action, of those persons who are and will be affected by a particular project or scheme. See Hart's Ladder of Participation (Ch.3) for a description of the degrees of participation.

Perception: This is the process of sensing, (seeing, hearing, tasting, smelling, touching), acting on and understanding an event. The event is then incorporated into the personal cognitive structure as a base for future sensing, acting and understanding. Perception is the base of the human understanding of his environment.

Primary Environmental Care: This United Nations- sponsored scheme aims to encourage people to care for the basic resources of the environment. The PEC schemes are mostly confined to the less-industrialised nations. Where direct reliance on the products of the physical environment is crucial to physical survival, women, children and men are encouraged to manage their limited physical resources in a sustainable manner.

Semiotics: This is the science and study of the meaning of signs and symbols embedded within the cultural structures of our society. These structures range from language, music, and architecture, to behaviour and social ritual.

Structural Coupling: A term used by Maturana and Varela to describe interrelation between the individual unity and the environment in which it is set. Structural coupling involves an action on both sides, a change of state happens to one side because of the other, and vice versa. As such, structural coupling is a holistic phenomena and a cyclical one.

Structuralism: denotes the study of internal interrelationships between mutually dependent components to illuminate the visible outward characteristics, which their interaction causes them to express. Structuralism is the form used to express the phenomena of analogous patterns existing within different areas of knowledge.

Sustainable Development: Sustainable implies a steady state, where balance operates. Development implies an evolutionary process where one state progresses into the next as a natural tendency to react within ecological systems. In order to achieve sustainable development in the environment, there must be an evolution from one state of repose to the next.

Sustainable Physical Contexts: These refer to areas in the physical environment where the natural ecology is either not impaired or has been 'repaired' to the extent that the area supports a rich diversity of species, and creates no waste that cannot be processed within the local ecological system.

Symbols: A symbol is the reference point for a collective cultural identity. Symbols are condensed from the current paradigm of the culture. They are a means to understand the collective perceptions of place.

Systems: The elements of a system operate in cyclical, regular, and three-dimensional relationships with each other. A system can be open or closed, either way; it implies a

communication between elements in order to bring about some form of process. The interaction becomes more obvious than the elements.

Texts: These, like semiotic signs are elements of the environment, which can be read for meaning. Text is another word for semiotic signs. The form of a structure, its decoration, the tone of a sentence uttered to a child or the texture of a slide after heavy frost, can all be 'read' and imbibed with meaning.

Values: Values are metaphysical structures, which hold collective interpretations of the inherent goodness or usefulness of a process, event, or thing. Values are based on a collective experience shared by members of a culture, they relate to essential needs whose value is measured by their difficulty in fulfilment.

Variables: These are factors, which are important for a particular process. In the above text, they represent the most important issues to consider when analysing a situation.

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